

D6.9 Data Management Plan

Final version

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Summary

This deliverable presents ICARIA’s Final Data Management Plan. It complements the Initial Data Management Plan (D6.8) and provides an overview of the datasets and other outputs handled in ICARIA, together with the arrangements applied for their documentation, sharing, preservation and reuse.

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Document history

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List of Acronyms and Abbreviations

CC-BY	Creative Commons Attribution
CS	Case Study
DoA	Description of the Action
DMP	Data Management Plan
DMS	Data Management Statement
DOI	Digital Object Identifier
DSS	Decision Support System
FAIR	Findable, Accessible, Interoperable and Reusable
GDPR	General Data Protection Regulation
HE	Horizon Europe
INSPIRE	Infrastructure for Spatial Information in Europe
NDA	Non-Disclosure Agreement
PID	Persistent identifier
RAF	Resilience Assessment Framework
RAT	Resilience Assessment Tool
T	Task
WP	Work Package

Executive summary

The Data Management Plan (DMP) sets out ICARIA's approach to managing project data and other research outputs. It describes how data is collected, generated and reused, and how it is documented, stored, protected and shared. The DMP clarifies the conditions under which outputs are made accessible, including open access publishing routes, the use of repositories and persistent identifiers (PIDs) where applicable, and any limitations related to confidentiality, third-party restrictions or sensitive content. It also addresses practical arrangements for storage, backup, preservation and long-term stewardship, together with the handling of legal and ethical considerations, including GDPR-related aspects where relevant.

This updated deliverable builds on the initial DMP (D6.8) and reflects the transition from planned arrangements to implemented practice. It consolidates partner reporting across all Work Packages (WP) through the DMP collection template and is complemented, where applicable, by the Data Management Statements (DMS) included in deliverable annexes. Together, these sources provide an evidence-based overview of the datasets and other outputs handled in ICARIA, the formats and documentation practices used, the access conditions and reuse terms applied, and the measures in place for security and responsible sharing. The deliverable therefore ensures traceability from project-level conclusions to WP- and deliverable-level information, while keeping the main text focused on the final status of the project.

D6.9 is the final version of the ICARIA Data Management Plan and the final output of Task T6.3. For this reason, the deliverable also addresses post-project availability and preservation responsibilities, confirming how ICARIA results will remain accessible and usable beyond the project's lifetime.

1 Introduction

This deliverable describes how data and other research outputs produced or reused within ICARIA have been managed in practice: how they were documented, stored, shared, protected, and prepared for longer-term availability, in line with European Commission guidance and the Findable, Accessible, Interoperable and Reusable (FAIR) principles.

The ICARIA DMP is a “living” project document in the sense that it accompanies the work as it progresses. The initial DMP, D6.8 (Lavasa & de la Cruz, 2023), set out the project’s intended approach: the types of data expected, the planned sharing routes, and the principles that would guide partners’ handling of data during implementation. D6.9 (final version) continues that document and brings it to its final state. The purpose here is not to restate intentions, but to capture the implemented arrangements and the state of project outputs at the end of the action: what data and outputs exist, how they are described, where they are stored or published, what access conditions apply, and what constraints (where applicable) have shaped sharing decisions.

As this is the final version of the DMP, D6.9 also places stronger emphasis than D6.8 on the post-project perspective. Where data and outputs are made openly available, this version clarifies the channels and conditions for access and reuse. Where open publication is not possible or not appropriate (for example due to third-party restrictions, security-sensitive content, or other legitimate limitations), the DMP states the approach followed and the arrangements used to ensure responsible handling. In this way, D6.9 provides a consolidated reference for both project partners and external stakeholders on how ICARIA outputs are managed at the point of project completion.

1.1 Scope

For the purposes of this DMP, “data” is understood broadly and includes:

- **Research data** collected, generated, processed, or reused during ICARIA activities. This may include, depending on the WP and task, inputs used for analysis (e.g., climate, hazard, exposure or vulnerability-related datasets), intermediate processing products, and outputs such as indicators, scenario results, and geospatial layers (risk, damage, etc.).
- **Other research outputs** that are necessary to understand, validate, or reuse the results of the project, including (where relevant) software/code, workflows, documentation and technical material supporting interpretation and reuse.

The DMP addresses the main stages of the data lifecycle across the project: creation or collection (including reuse of existing sources), documentation and metadata, storage and backup during implementation, conditions for access and sharing (including open, embargoed, or restricted access), legal and ethical requirements where applicable, security measures, and arrangements for retention and preservation after the project ends.

The final DMP is supported by partner reporting through the DMP collection template and, where applicable, by the data DMSs included in the annexes of project deliverables.

2 Methodology

This chapter explains how the final Data Management Plan (D6.9) was compiled and validated at project level. The objective of the final DMP is to provide a consolidated view of the data and other research outputs produced in ICARIA at the end of the project, while maintaining continuity with the data management policy defined in the initial DMP (D6.8).

The initial DMP established the general principles for data management in the project, including the commitment to Open Science, the application of FAIR principles, the use of Zenodo and other open infrastructures for dissemination, the responsibility of partners for the management of their own data and tools, and specific provisions for sensitive information, including data related to critical infrastructures and personal data. The final DMP does not redefine these principles, but verifies how they have been applied in practice based on the outputs generated during the project.

To support this validation, data management information was collected from partners using a common template designed for the final DMP. The template was based on the Horizon Europe DMP template (European Commission, 2021), adapted to the structure of ICARIA, and used to gather comparable information across all Work Packages. The template captures, at task level, the information required for the final DMP, including:

- data and output description,
- provenance and reuse,
- formats and documentation,
- FAIR-related aspects,
- access and licensing,
- storage and preservation intentions, and
- any legal/ethical/security constraints.

In parallel, following the approach introduced in D6.8, based on the KNOWING project (Grant Agreement 101056841), all ICARIA deliverables include a Data Management Statement (DMS) in their annex. These statements provide deliverable-level information on data used and generated, including format, size, ownership, reuse conditions, and, where applicable, repository links or persistent identifiers. The use of DMSs allowed a structured tracking of data management throughout the project.

In addition to partner reporting, publicly shared datasets and other open outputs were published through the ICARIA Zenodo community, which has been used during the project as the main repository for datasets and other citable results. The Zenodo records provide persistent identifiers, metadata and licence information, and therefore constitute an additional reference for confirming the dissemination and preservation of project outputs.

For the preparation of the final DMP, the information provided in the collection template was cross-checked against the deliverable-level DMSs in order to ensure consistency, avoid omissions, and confirm the link between the final reporting and the actual project outputs. Based on this evidence, Chapters 4 to 7 provide a concise project-level summary of how the data management policy defined in D6.8 has been implemented in practice, covering the application of the FAIR principles, storage and preservation, security and access control, and legal and ethical aspects. These chapters do not introduce new rules, but confirm the arrangements applied during the project in light of the outputs reported by the partners.

3 Dataset Overview

3.1 ICARIA Zenodo community records

At the end of the project, the following records are available on ICARIA’s Zenodo community¹, as summarised in Table 1 below.

Table 1: Zenodo overview (ICARIA community)

#	Zenodo record title	Link / DOI	Resource type (dataset/figure)	Licence	Connected ICARIA deliverable
1	ICARIA: climate projections from statistical downscaling outputs	https://zenodo.org/records/10964398	Dataset	CC-BY 4.0	D1.2
2	ICARIA: spatially distributed climate projections from statistical downscaling	https://doi.org/10.5281/zenodo.12930101	Dataset	CC-BY 4.0	D1.2
3	ICARIA: dynamically downscaled climate projections using two regional climate models	https://doi.org/10.5281/zenodo.14937418	Dataset	CC-BY 4.0	D1.2
4	ICARIA D2.4 Input data	https://doi.org/10.5281/zenodo.17455505	Dataset	CC-BY 4.0	D2.4
5	ICARIA D2.4 Multi Hazard Joint Probability Assessment Dataset	https://doi.org/10.5281/zenodo.17455541	Dataset	CC-BY 4.0	D2.4
6	ICARIA D4.2 Mittersill risk assessment	https://doi.org/10.5281/zenodo.18633204	Figure	CC-BY 4.0	D4.2
7	Heatwave Risk Assessment on	https://doi.org/10.5281/zenodo.18709629	Figure	CC-BY 4.0	D4.2

¹ <https://zenodo.org/communities/icaria/records?q=&l=list&p=1&s=10>

	Buildings, Syros Island Greece				
8	Wildfire risk assessment of Rhodes Island (SAR)	https://doi.org/10.5281/zenodo.18712826	Figure	CC-BY 4.0	D4.2
9	Multihazard risk assessment of Rhodes island (SAR)	https://doi.org/10.5281/zenodo.18715683	Figure	CC-BY 4.0	D4.2
10	Wildfire risk assessment of Mittersill	https://doi.org/10.5281/zenodo.19129659	Figure	CC-BY 4.0	D4.3
11	Flood assessment in Naxos	https://doi.org/10.5281/zenodo.19237744	Figure(s)	CC-BY 4.0	D4.3
12	Wind assessment in Syros	https://doi.org/10.5281/zenodo.19237591	Figure(s)	CC-BY 4.0	D4.3

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3.2 DMP collection template reporting

The following sub-sections present the detailed tables for each Work Package at task level, as provided by partners through the DMP collection template. These tables constitute the evidence base for the final DMP and ensure traceability between the data management policy defined in D6.8, the deliverable-level Data Management Statements (DMS), and the final reporting.

Some tasks do not use or generate datasets due to their nature (e.g. literature review, project coordination, or methodological work) and are therefore marked as “N/A” (Not Applicable) in the corresponding tables.

Work Packages WP6 (Project coordination and management) and WP7 (Ethics requirements) do not produce data management plans as they do not collect or generate data beyond operational information required for the management of the project and the consortium (please refer to Chapters 6 and 7 for more information).

3.2.1 WP1 tasks DMP

Table 2: WP1 Data Management Plan Final

Task	T1.1 - Risk/impact modelling framework	T1.2 - Climate scenario building	T1.3 - Modelling input requirements and methods to treat data gaps and uncertainties	T1.4.- WP1 lab: testing of methods and tools
<i>Task leader</i>	UNINA	FIC	CERTH	CERTH
A. DATA SUMMARY				
A1. Purpose of the data				
<i>Describe the purpose of data collection/generation and its relationship to the objectives of ICARIA</i>	Task 1.1 develops the ICARIA Holistic Multi-Hazard Risk/Impact Modelling Framework (Deliverable D1.1). The purpose is to: Define a harmonized and exportable methodological architecture for multi-hazard risk/impact	Task T1.2 is in charge of creating the basis of ICARIA's project with respect to the climate information in need for its proper development. This task collects information from openly available sources outside of the project, like climate models,	This task identified and optimised the treatment data gaps, and provided a list of sources for collecting potentially useful data for conducting climate risk and resilience assessment of critical assets. As such, the task did not	N/A

	<p>assessment; Integrate resilience determinants (Coping Capacity – CC, Adaptive Capacity – AC, Transformative Capacity – TC) into the modelling workflow; Provide the conceptual and technical structure used by WP2 (Hazard modelling) and WP3 (Exposure, Vulnerability, Impact and Resilience modelling); Define data requirements, modelling inputs/outputs, metadata structure, and data harmonization procedures. No primary hazard or impact datasets are generated in WP1. The task defines modelling specifications and data requirements for subsequent WPs.</p>	<p>weather observations or climate reanalysis, as well as data facilitated by entities to be used within the project, like specific weather measurements. Climate information is treated and statistically/dynamically downscaled to generate climate projections and hazard indicators for other tasks to use them.</p>	<p>use or generate data; the only collected data were in the form of answers to a domain expert survey.</p>	
A2. Data types and formats				
<p><i>Types and formats of generated/re-used data, e.g. measurements, images, surveys, models, code; CSV, XLSX, JSON, TIFF, PDF, etc.</i></p>	<p>Generated in WP1:</p> <ul style="list-style-type: none"> - Conceptual modelling framework documentation (PDF – D1.1) - Methodological guidelines (PDF) - Framework diagrams and modelling architecture schematics (PDF, image formats) - Tables defining input/output structures (PDF) - Taxonomy definitions and resilience metrics specifications (PDF) - References to public datasets 	<p>The task generates and processes heterogeneous data types, including:</p> <p>Input data:</p> <ul style="list-style-type: none"> - Weather measurements datasets (TXT, CSV), climate models and climate reanalysis datasets (NetCDF) to feed the generation of climate downscaling processes. <p>Derived data:</p> <ul style="list-style-type: none"> - Corrected and extended weather observations (TXT), statistically downscaled projections at point- 	<p>ICARIA's domain expert survey was produced, and hosted in the following link: https://ec.europa.eu/eusurvey/runner/f96af3c2-67bc-11df-2c43-f5f6b97351cd</p>	<p>N/A</p>

	<p>(textual documentation) No primary geospatial or numerical datasets are generated in this task. Re-used data (referenced but not stored):</p> <ul style="list-style-type: none"> - Climate projections - Remote sensing datasets - Asset inventories - Statistical datasets 	<p>station locations (TXT) and geospatially distributed results (GeoTIFF), dynamically downscaled scenarios (NetCDF)</p>		
A3. Reuse of existing data				
<p><i>Do you re-use any existing data and what do you re-use it for?</i></p>	<p>WP1 does not directly process datasets but defines the reuse of existing data in WP2 and WP3, including:</p> <ul style="list-style-type: none"> - Copernicus Climate Data Store (CDS) - Copernicus Land Monitoring Service - Copernicus Emergency Management Service (CEMS) - CORINE Land Cover - EFAS (European Flood Awareness System) - National meteorological and hydrological datasets - Eurostat demographic/economic data - OpenStreetMap (asset mapping) - National cadastral/infrastructure datasets 	<p>Task 1.2 reuses all input information (weather data, climate models and ERA5-Land/CHELSA reanalysis) for the generation of the downscaling of climate models and the production of climate projections. Weather datasets (subhourly) are also used to produce some of the hazard indicators needed, like IDF curves.</p>	<p>N/A</p>	<p>N/A</p>

	These datasets may be reused for hazard characterization, exposure and vulnerability analyses and impact assessment in WP2 and WP3			
A4. Origin/Provenance of the data				
<i>What is the origin/provenance of the data, either generated or re-used?</i>	<p>T1.1 has generated no data</p> <p>Referenced external data provenance from public datasets can be summarized as follows:</p> <ul style="list-style-type: none"> - EU Copernicus services - National authorities - Public statistical offices - Open geospatial databases 	<p>Data originate from:</p> <ul style="list-style-type: none"> - European weather agencies and open weather repositories (AEMet, BCASA, SMC, PdE, DWD, ZAMG, Meteo.gr, NOAA) - Open European climate datasets (Copernicus C3S, ISIMIP) - Open global climate datasets (e.g. ESGF) <p>All data used, format and precedence is documented in D1.2</p>	N/A	N/A
A5. Size of the data				
<i>What is the size of the data? (e.g. MB/GB, number of files)</i>	No datasets are generated under T1.1	<p>The volume of data varies depending on whether it is input or produced data.</p> <ul style="list-style-type: none"> -The size of collected input data, stored at internal servers of FIC/AIT, goes from tens to hundreds of MB for daily weather observations, 10 GB for subdaily weather observations and up to several TB (1-10TB) for each of the climate models and climate reanalysis datasets used (~35 TB in total) 	N/A	N/A

		-Produced data ranges from MB for corrected weather datasets to several hundreds of MB to a few GB for climate projections in all their formats.		
A6. Data utility				
<i>To whom might be useful ('data utility'), outside the project in terms of potential value or relevance of the data.</i>	<p>Data taxonomies and reusable open data are useful to:</p> <ul style="list-style-type: none"> - Climate risk and resilience researchers - Infrastructure operators - Public authorities - Disaster risk management agencies - EU-funded climate adaptation projects - Decision Support System (DSS) developers <p>The framework is exportable beyond ICARIA case studies and applicable to other EU regions.</p>	The results of T1.2 results are potentially useful to the scientific community, public authorities, infrastructure operators, and practitioners working on climate risk assessment, resilience planning, and adaptation decision-making. Data is made freely available for other research communities to use them in the study areas.	N/A	N/A
B.1 FAIR DATA: FINDABLE				
B.1.1 Data identification				
<i>Do you make use of persistent and unique identifiers such as Digital Object Identifiers (DOI)?</i>	The ICARIA taxonomy and holistic modelling framework are accessible at the following DOI: https://doi.org/10.1016/j.ijdr.2025.105319	Yes, T1.2 has published its generated datasets if freely accessible platforms for the research community to reuse them. Mainly, datasets have been linked to ICARIA's community in ZENODO, as well as linked too to	N/A	N/A

		<p>OpenAIRE and the EU Open Research Repository, with the following formats for:</p> <p>ICARIA: climate projections from statistical downscaling outputs https://zenodo.org/records/1096439</p> <p>Spatially distributed climate projections from statistical downscaling https://zenodo.org/records/1293010</p> <p>Dynamically downscaled climate projections using two regional climate models https://zenodo.org/records/14937418</p>		
B.1.2 Provision of metadata				
<p><i>Is metadata provided to allow discovery of the dataset(s)? If yes, list the main metadata elements (e.g. title, creator, date, keywords).</i></p>	N/A	<p>Yes, technical metadata is automatically generated by ZENODO to allow a better and quicker identification of the datasets uploaded in the platform.</p>	N/A	N/A
B.1.3 Keywords				
<p><i>Are search keywords provided in the metadata to optimise the possibility for discovery and then potential re-use?</i></p>	<p>Multi-hazard risk modelling Climate resilience Compound events Cascading effects Hazard–Exposure–Vulnerability</p>	<p>Yes, they are listed in the previous row B1.2</p>	N/A	N/A

	Climate adaptation Critical infrastructure risk			
B.1.4 Versioning				
<i>Do you document different versions of the datasets to allow traceability. If yes, describe the versioning approach.</i>	N/A	Both datasets have only one version available (1.0), mentioned in row B1.2	N/A	N/A
B.1.5 Harvesting				
<i>Is metadata offered in such a way that it can be harvested and indexed (e.g. through repositories, catalogues, or standard protocols)?</i>	N/A	Metadata is easily indexed, filtered and consulted in the ZENODO platform where datasets are accessible	N/A	N/A
B.1.6 Standards for metadata creation				
<i>What disciplinary or general standards will be followed for the metadata? This refers to metadata standards (e.g. DataCite / Dublin Core) to support discovery and indexing in repositories.</i>	N/A	Following the own details that Zenodo offers for these datasets, Zenodo primarily uses the DataCite Metadata Schema (v4) for describing datasets and research objects, ensuring they are findable and citable. It also supports extended metadata formats including Dublin Core, MARCXML, and JSON-LD (Schema.org).	N/A	N/A
B.2 FAIR DATA: ACCESSIBLE				
B.2.1 Data repository				

<p><i>How will the data be accessible (e.g. by depositing it in a repository)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i></p>	N/A	<p>As mentioned in B1.1, data produced by T1.2 have been uploaded to Zenodo (and linked to OpenAIRE and EU Research Repository) for them to be freely accessible.</p>	<p>The files for deliverable T1.3 will be available on ICARIA's main website.</p>	<p>The files for deliverable T1.4 will be available on ICARIA's main website.</p>
B.2.2 Open and closed datasets				
<p><i>Will all data under this task be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why. If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.</i></p>	N/A	<p>Yes, all data have been made openly available for their reuse following FAIR principles.</p>	N/A	N/A
B.2.3 Conditions of access				
<p><i>Will the data be accessible through a free and standardized access protocol e.g. HTTP, FTP, APIs)? If there are restrictions on use, how will access be provided to the</i></p>	N/A	<p>The data has been made also available from FIC's side, regarding statistical downscaling, through its FTP portal (https://intercambio.ficlima.org/indexed/ICARIA/), mainly for</p>	N/A	N/A

<p><i>data, both during and after the end of the project?</i></p>		<p>ICARIA's partners to access and use the data produced. Since data is already available at Zenodo, after the project ends, this access will be deleted.</p>		
B.2.4 Identity verification				
<p><i>How will the identity of the person accessing the data be ascertained? Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?</i></p>	N/A	<p>There's no need to identify people accessing the data.</p>	N/A	N/A
B.2.5 Metadata accessibility				
<p><i>Is metadata made openly available and licensed under a public domain dedication (CC0)? Does the metadata include information enabling users to understand how access to the data can be requested or obtained?</i></p>	N/A	<p>Metadata from Zenodo is openly available, and data offered follows " Creative Commons Attribution 4.0 International " license, being explicitly mentioned in the download, as well as the citing method, if there's a reuse of the data made.</p>	N/A	N/A
B.2.6 Duration of accessibility				
<p><i>For how long will the data remain available and findable? Will metadata remain available even if the data are no longer accessible?</i></p>	N/A	<p>Datasets uploaded to Zenodo will remain being available and accessible for an undetermined time after ICARIA's end.</p>	N/A	N/A

B.2.7 Software required for access				
<i>Is reference to any software required to access or read the data provided?</i>	N/A	Access to Zenodo requires only a standard web browser.	No reference to any software is required to access or read the deliverable's T1.3 pdf file, as it is publicly available.	No reference to any software is required to access or read the deliverable's T1.4 pdf file, as it is publicly available.
B.3 FAIR DATA: INTEROPERABLE				
B.3.1 Vocabularies and ontologies				
<i>What data and/or metadata vocabularies, standards or methodologies are followed to make data interoperable? This refers to domain-relevant data formats, coordinate systems, controlled vocabularies, etc.</i>	The ICARIA Holistic Modelling Framework follows: <ul style="list-style-type: none"> - IPCC AR6 risk terminology - UNDRR disaster risk terminology - EU climate adaptation terminology - Standard geospatial coordinate systems (defined for WP2/WP3) 	T1.2 climate projections follow standards established by IPCC's AR6, with the use of 10 of the established CMIP6 climate models, plus 2 regional ones for dynamical procedure. Their names are fixed to the files, plus one of the 4 SSPs (Shared Concentration Pathways) followed for the simulation. Aside of this, indicators established through co-participation for the definition of hazards are defined in the product, most of them according to existing bibliography, ensuring the interoperability.	N/A	N/A
B.3.2 Interoperability of vocabularies and ontologies				
<i>If uncommon or project-specific ontologies or vocabularies are used or generated, are mappings</i>	N/A	No project-specific ontologies are created or published under Task T1.2. Internal classifications, like the ad-hoc definition of a small number of indicators, are aligned	No uncommon or project-specific ontologies or vocabularies were used for T1.3.	No uncommon or project-specific ontologies or vocabularies were used for T1.3.

<i>provided to more commonly used standards?</i>		with commonly adopted practices in climate risk assessment.		
B.3.3 Data linkage				
<i>Does your data include qualified references to other data (e.g. other data from ICARIA, or datasets from previous research)?</i>	The ICARIA Holistic Modelling Framework explicitly references: - ICARIA WP2 hazard datasets - ICARIA WP3 exposure/vulnerability datasets - ICARIA DSS modules (CBA/MCA) - ICARIA T1.2 Downscaled climate projection and SSPs	Inputs, scenarios, and outputs are linked, when needed, to their corresponding identifier, specifically detailed in D1.2	Previous deliverables from the ICARIA project are referenced, especially those related to WP1.	Previous deliverables from the ICARIA project are referenced, especially those related to WP1.
B.4 FAIR DATA: REUSABLE				
B.4.1 Documentation				
<i>Do you provide documentation to ensure that data can be understood and reused by others (e.g. readme files with information on methodology, analyses, definitions, units of measurement, etc.)?</i>	D1.1 includes a detailed description of the elementary bricks constituting the holistic modelling framework and a full glossary of relevant terms adopted with references.	Yes, in the ZENODO webpage of all T1.2 datasets, detailed tables and descriptions explain all the methodology followed, the data used and the outputs available for their reuse. In the repository, a README file is available with the same information, including all indicators definition, units and source (if any).	N/A	N/A
B.4.2 Licensing and usage rights				
<i>Is your data freely available in the public domain (now or in the future) to permit re-use? Provide details on</i>	N/A	As mentioned previously, all T1.2 data is freely available now and, in the future, uploaded in Zenodo, following the " Creative Commons Attribution 4.0 International "	N/A	N/A

<i>licensing arrangements that support reusability.</i>		license allowing their reuse with a specific mention of the source of the data.		
B.4.3 Use by third parties				
<i>Is the data produced and/or used in the task usable by third parties, in particular after the end of the project? If limitations apply, please describe them.</i>	N/A	Yes, completely available and usable for third parties.	N/A	N/A
B.4.4 Documentation of provenance				
<i>Is the provenance of the data thoroughly documented and how?</i>	N/A	Yes, all data, its sources, permissions, quantity and type is completely documented. Information about it is accessible at D1.2 document of ICARIA project, plus in the information attached to the datasets.	N/A	N/A
B.4.5 Data quality				
<i>How is the data quality assured and documented? Include information regarding validation processes, quality control steps, or peer review.</i>	N/A	Data quality is completely assured through both verification and validations procedures. Weather data is passed to thorough quality tests before its usage; climate models are tested and corrected for their use, and all outputs go through validation tests with multiple statistical procedures. All methods, information and results,	N/A	N/A

		plus figures, are available at D1.2 document in its annexes.		
C. ALLOCATION OF RESOURCES				
C.1 Responsibility of data management				
<i>Who is responsible (partner) for data management within this task?</i>	UNINA	Fundación para la Investigación del Clima (FIC) is the partner responsible for data management within Task 1.2, in coordination with contributing partners.	CERTH	CERTH
C.2 FAIR costs				
<i>What are the costs for making your data FAIR in ICARIA (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.)? How will these be covered? Note that costs related to research data/output management may be eligible as part of the grant.</i>	N/A	No costs are foreseen for making T1.2 data FAIR. For data to be shared, open platforms such as Zenodo are used, which do not require payment. Costs related to hardware acquisition for storage, quality procedures and documentation are covered by the project budget since they were considered in the very beginning as key outcomes to be FAIR.	N/A	N/A
C.3 Long term preservation				
<i>How will long term preservation be ensured (if applicable)? What are the necessary resources to accomplish this (costs and potential value, who decides</i>	N/A	Long term preservation is guaranteed since data is stored in Zenodo already, with no costs for that and no time limit for its use.	N/A	N/A

<i>and how, what data will be kept and for how long)?</i>				
D. DATA SECURITY				
D.1 Data security				
<i>What provisions are in place for data security (including data recovery and secure storage and transmission of sensitive data)?</i>	N/A	Data is stored in Zenodo; no security is needed for its access or recovery. A copy of FIC data is also stored at the partner's servers privately, just in case it could be needed.	N/A	N/A
D.2 Data storage				
<i>Is the data stored securely in trusted or certified repositories for long-term retention and curation (internal and/or external)? If applicable, please specify the type of repository used.</i>	N/A	Data is stored in Zenodo repository, a trusted platform for open access and FAIR data sharing within the research community.	N/A	N/A
E. ETHICAL ISSUES				
E.1 Ethical or legal issues				
<i>Are there any ethical or legal issues that may affect data sharing? If relevant, please describe the issues and indicate whether they are addressed through the ethics review process or referenced in the Description of the Action (DoA).</i>	N/A	N/A	N/A	N/A

E.2 Personal data				
<i>Does the data include personal data? If yes, is compliance with the GDPR ensured? Is informed consent included for data sharing and long-term retention of personal data?</i>	N/A	N/A	N/A	N/A
F. OTHER RESEARCH OUTPUTS (software, models, etc)				
F.1 Description of other research outputs				
<i>Does the task generate or reuse other research outputs in addition to research data (e.g. software, algorithmic services, models, protocols, etc)? If yes, please describe the type of output and its role in the task.</i>	No other outputs are generated under the task	T1.2 produce only research data from input previously mentioned	N/A	N/A
F.2 Application of FAIR principles				
<i>Please indicate which of the following apply to the other research outputs:</i> <input type="checkbox"/> <i>The output can be found via a stable reference or landing page</i> <input type="checkbox"/> <i>The output can be accessed by others (open or</i>	N/A	N/A	N/A	N/A

<p><i>restricted access)</i></p> <p><input type="checkbox"/> <i>The output uses recognised standards, formats, or interfaces (if applicable)</i></p> <p><input type="checkbox"/> <i>The output can be reused by others (e.g. documentation or licence available)</i></p> <p><i>If none apply, please briefly explain why.</i></p>				
F.3 Repository				
<p><i>Where are these outputs made available (if applicable)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i></p>	N/A	N/A	N/A	N/A
F.4 Conditions of access and reuse				
<p><i>How are these outputs accessed and reused (e.g. open access, restricted access, internal use only)? If reuse is limited, please provide justification.</i></p>	N/A	N/A	N/A	N/A
F.5 Long-term preservation				
<p><i>Is maintenance or long-term availability foreseen after the end of the project? If yes,</i></p>	N/A	N/A	N/A	N/A

<i>please describe at a high level.</i>				
G. OTHER ISSUES				
Other methods of data management				
<i>Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes, please list and briefly describe them.</i>	N/A	N/A	N/A	N/A

3.2.2 WP2 tasks DMP

Table 3: WP2 Data Management Plan Final

Task	T2.1 - Hazards dynamics and multi-hazards interconnectivities analysis	T2.2 - Extreme multi-hazards and modelling scenarios	T2.3 - Coupled hazard models: methodology and tools	T2.4 - WP2 lab: testing of methods and tools
<i>Task leader</i>	AQUA	UNEXE	UNEXE	IREC-CERCA
A. DATA SUMMARY				
A1. Purpose of the data				
<i>Describe the purpose of data collection/generation and its relationship to the objectives of ICARIA</i>	Data management not applicable to this task, it simply gathers information about hazard modelling techniques already reported in D2.1 (no datasets produced).	Data management not applicable to this task. Task 2.2 overviewed the different hazards being assessed across the three case studies and identified approaches that can be utilised for assessing the likelihood of compound	Task 2.3 assessed a range of different multi-hazard scenarios with details pertaining to how respective approaches and modelling tools can be utilised to model compound hazard scenarios.	Task 2.4 aims to integrate and validate hazard models in the electrical sector and how they can affect cascading failures. The test is carried out with the specific objectives of initiating the modeling of the electrical model.

		coincident and compound consecutive hazards occurring. No data was produced in the task. Methodologies were described in D2.2.		No data is created, just methodologies described in D4.2.
A2. Data types and formats				
<i>Types and formats of generated/re-used data, e.g. measurements, images, surveys, models, code; CSV, XLSX, JSON, TIFF, PDF, etc.</i>	N/A	N/A	CSV, TXT, PNG, XLS, HTML	N/A
A3. Reuse of existing data				
<i>Do you re-use any existing data and what do you re-use it for?</i>	N/A	N/A	No	N/A
A4. Origin/Provenance of the data				
<i>What is the origin/provenance of the data, either generated or re-used?</i>	N/A	N/A	The input data were produced from downscaled climate modelling. The output data were the joint probability of combined/compound hazards under various climate scenarios.	N/A
A5. Size of the data				
<i>What is the size of the data? (e.g. MB/GB, number of files)</i>	N/A	N/A	835 MB	N/A
A6. Data utility				
<i>To whom might be useful ('data utility'), outside the project in terms of potential</i>	N/A	N/A	Scientists for analysing probabilities of multi-hazards.	N/A

<i>value or relevance of the data.</i>				
B.1 FAIR DATA: FINDABLE				
B.1.1 Data identification				
<i>Do you make use of persistent and unique identifiers such as Digital Object Identifiers (DOI)?</i>	N/A	N/A	Yes, as provided by Zenodo: https://zenodo.org/records/17455505 ; https://zenodo.org/records/17455541	N/A
B.1.2 Provision of metadata				
<i>Is metadata provided to allow discovery of the dataset(s)? If yes, list the main metadata elements (e.g. title, creator, date, keywords).</i>	N/A	N/A	Yes	N/A
B.1.3 Keywords				
<i>Are search keywords provided in the metadata to optimise the possibility for discovery and then potential re-use?</i>	N/A	N/A	Yes	N/A
B.1.4 Versioning				
<i>Do you document different versions of the datasets to allow traceability. If yes, describe the versioning approach.</i>	N/A	N/A	Yes	N/A
B.1.5 Harvesting				

<p><i>Is metadata offered in such a way that it can be harvested and indexed (e.g. through repositories, catalogues, or standard protocols)?</i></p>	N/A	N/A	Metadata is easily indexed, filtered and consulted in the Zenodo platform where datasets are accessible	N/A
B.1.6 Standards for metadata creation				
<p><i>What disciplinary or general standards will be followed for the metadata? This refers to metadata standards (e.g. DataCite / Dublin Core) to support discovery and indexing in repositories.</i></p>	N/A	N/A	Following the own details that Zenodo offers for these datasets, Zenodo primarily uses the DataCite Metadata Schema (v4) for describing datasets and research objects, ensuring they are findable and citable. It also supports extended metadata formats including Dublin Core, MARCXML, and JSON-LD (Schema.org).	N/A
B.2 FAIR DATA: ACCESSIBLE				
B.2.1 Data repository				
<p><i>How will the data be accessible (e.g. by depositing it in a repository)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i></p>	N/A	N/A	Zenodo, see B.1.1	N/A
B.2.2 Open and closed datasets				

<p><i>Will all data under this task be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why. If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.</i></p>	N/A	N/A	Yes	N/A
B.2.3 Conditions of access				
<p><i>Will the data be accessible through a free and standardized access protocol e.g. HTTP, FTP, APIs)? If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?</i></p>	N/A	N/A	via Zenodo	N/A
B.2.4 Identity verification				
<p><i>How will the identity of the person accessing the data be ascertained? Is there a need for a data access committee (e.g. to evaluate/approve access</i></p>	N/A	N/A	No need to identify the person accessing the data	N/A

<i>requests to personal/sensitive data)?</i>				
B.2.5 Metadata accessibility				
<i>Is metadata made openly available and licensed under a public domain dedication (CC0)? Does the metadata include information enabling users to understand how access to the data can be requested or obtained?</i>	N/A	N/A	CC-BY	N/A
B.2.6 Duration of accessibility				
<i>For how long will the data remain available and findable? Will metadata remain available even if the data are no longer accessible?</i>	N/A	N/A	Datasets uploaded to Zenodo will remain being available and accessible for an undetermined time after ICARIA's end.	N/A
B.2.7 Software required for access				
<i>Is reference to any software required to access or read the data provided?</i>	N/A	N/A	Access to Zenodo requires only a standard web browser.	N/A
B.3 FAIR DATA: INTEROPERABLE				
B.3.1 Vocabularies and ontologies				
<i>What data and/or metadata vocabularies, standards or methodologies are followed</i>	N/A	N/A	Metadata documentation includes all relevant clarifications for data interoperability	N/A

<i>to make data interoperable? This refers to domain-relevant data formats, coordinate systems, controlled vocabularies, etc.</i>				
B.3.2 Interoperability of vocabularies and ontologies				
<i>If uncommon or project-specific ontologies or vocabularies are used or generated, are mappings provided to more commonly used standards?</i>	N/A	N/A	N/A	N/A
B.3.3 Data linkage				
<i>Does your data include qualified references to other data (e.g. other data from ICARIA, or datasets from previous research)?</i>	N/A	N/A	No	N/A
B.4 FAIR DATA: REUSABLE				
B.4.1 Documentation				
<i>Do you provide documentation to ensure that data can be understood and reused by others (e.g. readme files with information on methodology, analyses, definitions, units of measurement, etc.)?</i>	N/A	N/A	Yes	N/A
B.4.2 Licensing and usage rights				

<i>Is your data freely available in the public domain (now or in the future) to permit re-use? Provide details on licensing arrangements that support reusability.</i>	N/A	N/A	Yes	N/A
B.4.3 Use by third parties				
<i>Is the data produced and/or used in the task usable by third parties, in particular after the end of the project? If limitations apply, please describe them.</i>	N/A	N/A	Yes	N/A
B.4.4 Documentation of provenance				
<i>Is the provenance of the data thoroughly documented and how?</i>	N/A	N/A	Yes	N/A
B.4.5 Data quality				
<i>How is the data quality assured and documented? Include information regarding validation processes, quality control steps, or peer review.</i>	N/A	N/A	ICARIA own's review procedures and the project validation by the European Commission validates the data quality	N/A
C. ALLOCATION OF RESOURCES				
C.1 Responsibility of data management				
<i>Who is responsible (partner) for data management within this task?</i>	AQUA	UNEXE	UNEXE	IREC

C.2 FAIR costs				
<p><i>What are the costs for making your data FAIR in ICARIA (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.)? How will these be covered? Note that costs related to research data/output management may be eligible as part of the grant.</i></p>	N/A	N/A	Free	N/A
C.3 Long term preservation				
<p><i>How will long term preservation be ensured (if applicable)? What are the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?</i></p>	N/A	N/A	Permanent via Zenodo	N/A
D. DATA SECURITY				
D.1 Data security				
<p><i>What provisions are in place for data security (including data recovery and secure storage and transmission of sensitive data)?</i></p>	N/A	N/A	Data is stored in Zenodo; no security is needed for its access or recovery.	N/A
D.2 Data storage				

<p><i>Is the data stored securely in trusted or certified repositories for long-term retention and curation (internal and/or external)? If applicable, please specify the type of repository used.</i></p>	N/A	N/A	Data is stored in Zenodo repository, a trusted platform for open access and FAIR data sharing within the research community.	N/A
E. ETHICAL ISSUES				
E.1 Ethical or legal issues				
<p><i>Are there any ethical or legal issues that may affect data sharing? If relevant, please describe the issues and indicate whether they are addressed through the ethics review process or referenced in the Description of the Action (DoA).</i></p>	N/A	N/A	N/A	N/A
E.2 Personal data				
<p><i>Does the data include personal data? If yes, is compliance with the GDPR ensured? Is informed consent included for data sharing and long-term retention of personal data?</i></p>	N/A	N/A	N/A	N/A
F. OTHER RESEARCH OUTPUTS (software, models, etc)				
F.1 Description of other research outputs				

<p><i>Does the task generate or reuse other research outputs in addition to research data (e.g. software, algorithmic services, models, protocols, etc)? If yes, please describe the type of output and its role in the task.</i></p>	N/A	N/A	N/A	N/A
<p>F.2 Application of FAIR principles</p>				
<p><i>Please indicate which of the following apply to the other research outputs:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>The output can be found via a stable reference or landing page</i> <input type="checkbox"/> <i>The output can be accessed by others (open or restricted access)</i> <input type="checkbox"/> <i>The output uses recognised standards, formats, or interfaces (if applicable)</i> <input type="checkbox"/> <i>The output can be reused by others (e.g. documentation or licence available)</i> <p><i>If none apply, please briefly explain why.</i></p>	N/A	N/A	N/A	N/A
<p>F.3 Repository</p>				

<i>Where are these outputs made available (if applicable)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i>	N/A	N/A	N/A	N/A
F.4 Conditions of access and reuse				
<i>How are these outputs accessed and reused (e.g. open access, restricted access, internal use only)? If reuse is limited, please provide justification.</i>	N/A	N/A	N/A	N/A
F.5 Long-term preservation				
<i>Is maintenance or long-term availability foreseen after the end of the project? If yes, please describe at a high level.</i>	N/A	N/A	N/A	N/A
G. OTHER ISSUES				
Other methods of data management				
<i>Do you, or will you, make use of other national/funder/sectorial/departamental procedures for data management? If yes,</i>	N/A	N/A	N/A	N/A

please list and briefly describe them.

3.2.3 WP3 tasks DMP

Table 4: WP3 Data Management Plan Final

Task	T3.1 - Tangible impacts assessment methods	T3.2 - Holistic resilience methods	T3.3 - Portfolio of Adaptation Solutions	T3.4 - Decision support system	T3.5 - WP3 lab: testing of methods and tools
<i>Task leader</i>	CETAQUA	LNEC	CETAQUA	DRAXIS	AQUA
A. DATA SUMMARY					
A1. Purpose of the data					
<i>Describe the purpose of data collection/generation and its relationship to the objectives of ICARIA</i>	Data management not applicable to this task, it simply gathers information about impact assessment modelling techniques already reported in D3.1 (no datasets produced).	The RAF App (LNEC) is the tool that implements ICARIA's resilience assessment framework, used for holistic assessment. It relates to the ICARIA objective of addressing region-wide climate resilience, for the region as a whole and for each specific service and assets, with dedicated developments made for Natural Areas. The RAT tool (DEMOKRITUS) relates specifically to critical infrastructure.	Task T3.3 developed the Portfolio of adaptation Solutions, a web-based tool designed to help users identify, characterise and prioritise climate adaptation measures. The dataset includes adaptation measures, their classifications, co-benefits, cost categories and related descriptive information. Its purpose is to support the design of Adaptation Strategies and their prioritisation according to hazards, sectors, scales and decision criteria	Task T3.4 develops the ICARIA Decision Support System (DSS), a web-based platform integrating climate projections, risk and impact assessment workflows, resilience assessment tools, and adaptation measures. Data is collected, generated, and processed to enable the functioning of the DSS and support decision-making for users.	Data management not applicable to this task. T3.5 preliminarily tested RAF and RAT tools, activities already reported in D3.5 (no datasets produced).

A2. Data types and formats					
<p><i>Types and formats of generated/re-used data, e.g. measurements, images, surveys, models, code; CSV, XLSX, JSON, TIFF, PDF, etc.</i></p>	N/A	Surveys and statistical data (EUROSTAT/worlstatistics)	CSV, XLSX, PDF	<p>The task generates and processes heterogeneous data types, including: Input data: - Geospatial and tabular datasets used for impact assessments, including hazard, exposure, vulnerability data, as well as climate projection data provided by ICARIA partners (SHP, GeoJSON, GeoTIFF, CSV). - Derived data: spatial datasets generated by assessment workflows and used for visualisation and analysis within the DSS (e.g. SHP). - Decision-support outputs: aggregated results, charts, maps, and reports generated by the DSS to support interpretation and decision-making (e.g. PDF, PNG, MP4).</p>	N/A
A3. Reuse of existing data					
<p><i>Do you re-use any existing data and what do you re-use it for?</i></p>	N/A	No	<p>Yes, reuses existing data from previous EU and related projects, main reused sources include CLARITY, RECONNECT, RESCCUE, NATURE4CITIES, UNALAB Catalogue, ThinkNature Handbook, Urban</p>	<p>The DSS reuses the following as inputs to the system for modelling, assessment, and visualisation purposes: - Climate projection data from WP1 (statistical and dynamical downscaling)</p>	N/A

			GreenUp, LIFE RESYSTAL and EU CIRCLE.	- Hazard, exposure, and vulnerability datasets from the ICARIA Case Studies - External open datasets (e.g. CORINE Land Cover)	
A4. Origin/Provenance of the data					
<i>What is the origin/provenance of the data, either generated or re-used?</i>	N/A	Generated in ICARIA (RAT/RAF tool from existing statistical / local GIS data & surveys)	<p>Previous and ongoing EU-funded projects of consortium partners and external sources.</p> <ul style="list-style-type: none"> - Open-source catalogues and deliverables containing adaptation measures. - Internal compilation work carried out under ICARIA T3.3 to harmonise and structure the measures for the platform. - The annex identifies reused datasets such as: <ul style="list-style-type: none"> - CLARITY (PDF, 19.8 MB, open source) - RECONNECT measures (Excel, 32 KB, open source) - Adaptation measures RESCCUE (Excel, 189 KB, open source) <p>A generated dataset:</p> <ul style="list-style-type: none"> - ICARIA D3.3 Measures (Excel, 271 KB) 	<p>Data originate from:</p> <ul style="list-style-type: none"> - ICARIA project partners (generated within WP1-WP3) - User-uploaded datasets during DSS execution (e.g. hazard maps, exposure data, vulnerability functions) - Open European datasets (e.g. Copernicus) <p>All processing steps and transformations are documented in DSS workflows and technical documentation.</p>	N/A
A5. Size of the data					

<p><i>What is the size of the data? (e.g. MB/GB, number of files)</i></p>	N/A	data in the ICARIA RAF App and RAT databases, small database files / pdf reports	Small data in MB	The volume of data varies depending on the assessment scenarios and user inputs. User-provided and derived datasets are typically in the order of megabytes per assessment, mainly consisting of geospatial layers and tabular data. Climate projection datasets reused by the DSS amount to several hundred megabytes.	N/A
A6. Data utility					
<p><i>To whom might be useful ('data utility'), outside the project in terms of potential value or relevance of the data.</i></p>	N/A	Data is useful to the respective users (scientific community, consultants, regional administration, risk management institutions and utilities)	The data may be useful for researchers working on climate adaptation and resilience; local, regional and national authorities developing adaptation plans; policy makers and climate adaptation design teams; urban and regional planners; other organisations interested in adaptation measure selection, comparison and prioritisation.	The results of the DSS are potentially useful to the scientific community, public authorities, infrastructure operators, and practitioners working on climate risk assessment, resilience planning, and adaptation decision-making, subject to access conditions.	N/A
B.1 FAIR DATA: FINDABLE					
B.1.1 Data identification					
<p><i>Do you make use of persistent and unique identifiers such as Digital Object Identifiers (DOI)?</i></p>	N/A	No	No	Task T3.4 does not generate standalone research datasets that require persistent identifiers. Input datasets remain the property of ICARIA	N/A

				partners or end users. Outputs produced by the DSS are assigned internal identifiers within the system database to support processing, traceability, and retrieval, but are not assigned persistent identifiers. Climate projection datasets reused by the DSS are already published with persistent identifiers by the responsible partners (see T1.2).	
B.1.2 Provision of metadata					
<i>Is metadata provided to allow discovery of the dataset(s)? If yes, list the main metadata elements (e.g. title, creator, date, keywords).</i>	N/A	In general, no. However, if the user provided open data sets, they can document these specific inputs	Yes, the measures are described using structured fields within the platform and dataset. <ul style="list-style-type: none"> - title/name of the measure, - hazard targeted, - key benefits, - measure type, - spatial scale, - area type, - target sector/assets, - co-benefits, - qualitative cost category, - source/reference. 	Metadata are maintained internally within the DSS database to support discovery, interpretation, and use of inputs and outputs during system operation. Dataset-level metadata for reused inputs (e.g. climate projections) are provided by the responsible ICARIA partners.	N/A
B.1.3 Keywords					
<i>Are search keywords provided in the metadata to optimise the possibility</i>	N/A	N/A	Yes. The platform uses searchable/filterable descriptive fields that function	Keywords and descriptors are applied at the level of the DSS, scenarios, and assessments	N/A

<p><i>for discovery and then potential re-use?</i></p>			<p>as discovery keywords, including:</p> <ul style="list-style-type: none"> - climate hazard, - key benefits, - measure type, - spatial scale, - area type, - target sector/asset. 	<p>within the system to support internal search and filtering. No external dataset-level keyword publication is foreseen.</p>	
B.1.4 Versioning					
<p><i>Do you document different versions of the datasets to allow traceability. If yes, describe the versioning approach.</i></p>	N/A	No (RAF) and N/A (RAT)	N/A	<p>Versioning is applied to the DSS software and workflows. Input and output data are versioned internally within the DSS relational database to support traceability and reproducibility during system operation, but are not released or managed as versioned standalone datasets.</p>	N/A
B.1.5 Harvesting					
<p><i>Is metadata offered in such a way that it can be harvested and indexed (e.g. through repositories, catalogues, or standard protocols)?</i></p>	N/A	N/A	N/A	<p>Metadata for inputs and outputs handled by the DSS are not exposed for external harvesting or indexing. Harvesting may apply to software or documentation published separately.</p>	N/A
B.1.6 Standards for metadata creation					
<p><i>What disciplinary or general standards will be followed for the</i></p>	N/A	N/A	N/A	<p>Internal metadata structures follow common practices suitable for database-backed</p>	N/A

<p><i>metadata? This refers to metadata standards (e.g. DataCite / Dublin Core) to support discovery and indexing in repositories.</i></p>				<p>software. Formal metadata standards are applied only where data or software are published by the responsible partners. For geospatial data visualised in the Map Viewer, metadata structures follow an INSPIRE-like approach as implemented through the GeoServer configuration (e.g. layer descriptions, spatial reference information, and thematic grouping).</p>	
<p>B.2 FAIR DATA: ACCESSIBLE</p>					
<p>B.2.1 Data repository</p>					
<p><i>How will the data be accessible (e.g. by depositing it in a repository)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i></p>	<p>N/A</p>	<p>Input data is provided by ICARIA partners or uploaded by users and accessed through the RAF or RAT. Outputs are generated on demand within the RAF or RAT and may be deposited in external repositories by users at their discretion. Generically, data is stored in internal systems, only accessible to the users that created the assessments, through a username and a password (in the RAF app situation)</p>	<p>The adaptation measures are accessible through the ICARIA Adaptation Strategies Platform website.</p>	<p>Task T3.4 does not require systematic deposition of datasets in external repositories. Input data is provided by ICARIA partners or uploaded by users and accessed through the DSS. Outputs are generated on demand within the DSS and may be deposited in external repositories by users at their discretion. Climate projection datasets reused by the DSS are already published on Zenodo and maintained by the responsible partners. Software</p>	<p>N/A</p>

				and code dissemination are addressed in Section F.	
B.2.2 Open and closed datasets					
<i>Will all data under this task be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why. If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.</i>	N/A	Input data remains under the ownership of ICARIA partners or users. Outputs generated by the tools are primarily intended for decision support and are not systematically published as open datasets. Only processed data in RAF/RAT is open in scientific publications or upon request from users	Core measure information is openly visible through the public platform, while some advanced functionalities and user-generated strategy content require registration. Registration is open access.	Not all data handled under Task T3.4 can be made openly available. Input data remains under the ownership of ICARIA partners or users. Outputs generated by the DSS are primarily intended for decision support and are not systematically published as open datasets.	N/A
B.2.3 Conditions of access					
<i>Will the data be accessible through a free and standardized access protocol e.g. HTTP, FTP, APIs)? If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?</i>	N/A	Data is only accessible to the users that created the assessments or to those that they give their username and password (in the RAF app situation) or by using a link upon request (RAT)	Access is provided through the web platform using standard web access over HTTP/HTTPS. Public users can browse the measures database openly. Registered access is required for additional features such as creating strategies and storing results. The back-end is restricted to administrators.	Access to input and output data is provided through the DSS interface using standard web protocols. Any further sharing or publication of datasets is determined by the data owners.	N/A

B.2.4 Identity verification					
<i>How will the identity of the person accessing the data be ascertained? Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?</i>	N/A	Data access is limited to consortium partners; LNEC oversees internal access, using credentials given upon request. RAT - Data available to users requesting the service	Public measure browsing does not require identity verification. Registered-user functions require sign-up with basic user information such as name, surname, organisation, field of work and position.	Access to the DSS is controlled through user authentication mechanisms. No dedicated data access committee is required.	N/A
B.2.5 Metadata accessibility					
<i>Is metadata made openly available and licensed under a public domain dedication (CC0)? Does the metadata include information enabling users to understand how access to the data can be requested or obtained?</i>	N/A	N/A	N/A	No external publication of dataset-level metadata is foreseen under this task.	N/A
B.2.6 Duration of accessibility					
<i>For how long will the data remain available and findable? Will metadata remain available even if the data are no longer accessible?</i>	N/A	According to the GA	According to the GA	Input and output data is retained within the DSS according to operational and project needs. Long-term accessibility of datasets, where relevant, is the responsibility of the data owners.	N/A
B.2.7 Software required for access					

<p><i>Is reference to any software required to access or read the data provided?</i></p>	N/A	Access requires only a standard web browser.	Access requires only a standard web browser.	Access to the DSS requires only a standard web browser.	N/A
<p>B.3 FAIR DATA: INTEROPERABLE</p>					
<p>B.3.1 Vocabularies and ontologies</p>					
<p><i>What data and/or metadata vocabularies, standards or methodologies are followed to make data interoperable? This refers to domain-relevant data formats, coordinate systems, controlled vocabularies, etc.</i></p>	N/A	<p>In the RAF, interoperability is supported by following established resilience assessment frameworks and alignment with ISO standards for urban resilience, risk management, and quality assurance, including: - ISO 37120:2018 – Indicators for city services and quality of life; ISO 37122:2019 – Indicators for smart cities; ISO 37123:2019 – Indicators for resilient cities; ISO 31000:2018 – Risk management guidelines; ISO 9001:2015 – Quality management systems, emphasizing continuous improvement. // RAT: CER Directive - ISO 31000 - schema.org.</p>	<p>The task uses structured classifications and recognised methodological frameworks to improve interoperability, including:</p> <ul style="list-style-type: none"> - hazard categories, - sector/asset categories, - area type, - spatial scale, - co-benefits typology, - and especially the EEA Key Type Measures (KTM) classification for measure types. 	<p>Interoperability within the DSS is supported through the use of standard geospatial formats and spatial reference systems (e.g. coordinate reference systems) and by applying consistent terminology and categories defined by established climate risk and adaptation methodologies. These include the use of standard concepts such as hazard, exposure, and vulnerability, predefined hazard types addressed by the DSS (e.g. floods, wildfires, windstorms), classes used in the analyses (e.g. CORINE-based), and fixed scoring schemes for resilience and risk assessments as implemented in the DSS workflows.</p>	N/A
<p>B.3.2 Interoperability of vocabularies and ontologies</p>					

<p><i>If uncommon or project-specific ontologies or vocabularies are used or generated, are mappings provided to more commonly used standards?</i></p>	N/A	N/A	N/A	No project-specific ontologies are created or published under Task T3.4. Internal classifications are aligned with commonly adopted practices in climate risk and adaptation assessment where applicable.	N/A
B.3.3 Data linkage					
<p><i>Does your data include qualified references to other data (e.g. other data from ICARIA, or datasets from previous research)?</i></p>	N/A	No persistent external data links are created. Results from e.g. modelling, maps, risk assessment and plans are used to answer the survey and may be referenced by the user in comments to each question - RAT: proposed datasets (reference data sets have been proposed).	Yes. The T3.3 data are explicitly linked to: - previous projects: CLARITY, RESCCUE, RECONNECT and others; - the ICARIA impact assessment methods in D3.1; - the Decision Support System (DSS) developed in T3.4; - future assessment outputs from T4.2 and T4.3	Inputs, scenarios, and outputs are linked internally within the DSS using internal identifiers. No persistent external data links are created.	N/A
B.4 FAIR DATA: REUSABLE					
B.4.1 Documentation					
<p><i>Do you provide documentation to ensure that data can be understood and reused by others (e.g. readme files with information on methodology, analyses, definitions, units of measurement, etc.)?</i></p>	N/A	Users have access to such documentation. In the RAF, a detailed manual is provided, supporting navigation. Guidance, legends and info buttons are also available to support users correct interpretation during use.	The platform itself includes descriptive fields for each measure, FAQs, and source references that help users understand the meaning, origin and intended use of the data.	A detailed manual is provided to describe all aspects of the DSS, supporting correct interpretation during use. Guidance, legends and info buttons are also available on the DSS to help users understand the DSS and data.	N/A

B.4.2 Licensing and usage rights					
<p><i>Is your data freely available in the public domain (now or in the future) to permit re-use? Provide details on licensing arrangements that support reusability.</i></p>	N/A	<p>RAF: No. Any licensing or reuse data or outputs is determined by the users or partners who generate them, taking into account the licensing of the underlying input data. RAT tool: upon request.</p>	<p>Reused source datasets include open-source material. The exact licence of the compiled ICARIA T3.3 dataset/platform content should be confirmed if a formal open licence is to be declared.</p>	<p>Licensing of input data is defined by the original data providers. Outputs generated by the DSS are produced on demand for decision-support purposes, and no specific licences are assigned to them under Task T3.4. Any licensing or reuse of such outputs is determined by the users or partners who generate them, taking into account the licensing of the underlying input data.</p>	N/A
B.4.3 Use by third parties					
<p><i>Is the data produced and/or used in the task usable by third parties, in particular after the end of the project? If limitations apply, please describe them.</i></p>	N/A	<p>RAF: only accessible to the users that created the assessments or to those that they give the username and password</p>	<p>Yes, the public platform is designed for use by third parties such as researchers, planners and policy makers.</p>	<p>Data used and produced in Task T3.4 are usable by third parties through the DSS, subject to access to the software and to the rights associated with the underlying input data.</p>	N/A
B.4.4 Documentation of provenance					
<p><i>Is the provenance of the data thoroughly documented and how?</i></p>	N/A	<p>No. Data sources / inputs can be referenced by the user in a comments box in RAF.</p>	<p>Yes. Provenance is documented in the deliverable's section on Measures Sources; Annex 1 tables listing reused and produced datasets; references</p>	<p>For user-specific assessments, the DSS records provenance information in the backend, linking user-provided inputs to the outputs generated and making this information available to the respective users</p>	N/A

			to source projects and source documents.	through their accounts. Dataset-level provenance for static data available to all users is limited (e.g. climate projections) and remains the responsibility of the original data providers.	
B.4.5 Data quality					
<i>How is the data quality assured and documented? Include information regarding validation processes, quality control steps, or peer review.</i>	N/A	The assessment is supposed to be done by a resilience assessment team, with multiple inputs and internal validation. The assessment considers objective questions based on facts or data, no questions based on perceptions or opinions are asked. Uncertainty is not quantified.	Data quality is supported through the reuse of measures from established previous EU projects, together with internal review and harmonisation carried out within T3.3.	Data quality is supported through validation checks, controlled workflows, and consistency checks implemented within the DSS.	N/A
C. ALLOCATION OF RESOURCES					
C.1 Responsibility of data management					
<i>Who is responsible (partner) for data management within this task?</i>	CETAQUA	LNEC for RAF and DEMOKRITOS for RAT tool, in coordination with contributing partners.	CETAQUA is responsible for data management within Task T3.3, in coordination with contributing partners.	DRAXIS is responsible for data management within Task T3.4, in coordination with contributing partners.	AQUA
C.2 FAIR costs					
<i>What are the costs for making your data FAIR in ICARIA (e.g. direct and indirect costs related to storage, archiving, re-use,</i>	N/A	N/A	N/A	No costs are foreseen for making task-level data FAIR. For data or software to be shared, open platforms such as Zenodo can be used, which do not	N/A

<p><i>security, etc.)? How will these be covered? Note that costs related to research data/output management may be eligible as part of the grant.</i></p>				<p>require payment. Costs related to software development, hosting, and documentation are covered by the project budget.</p>	
C.3 Long term preservation					
<p><i>How will long term preservation be ensured (if applicable)? What are the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?</i></p>	N/A	<p>The apps and the data created by the users is preserved in LNEC's or DEMOKRITOS internal systems (respectively, for the RAF and the RAT), no costs associated. Decisions on the maintenance and long-term availability may be taken at project or partner level after the end of the project, depending on resources and the exploitation plan.</p>	<p>Long-term preservation beyond project completion should be confirmed by the responsible partner; no formal archival plan is explicitly described.</p>	<p>Long-term preservation of task-level data is not defined at this stage. Decisions on the maintenance and long-term availability of the DSS and related outputs may be taken at project or partner level after the end of the project, depending on resources and the exploitation plan.</p>	N/A
D. DATA SECURITY					
D.1 Data security					
<p><i>What provisions are in place for data security (including data recovery and secure storage and transmission of sensitive data)?</i></p>	N/A	<p>Data security is ensured through controlled access, user authentication, secure storage, and frequent backups in the RAF situation / backup bi-monthly for RAT.</p>	<p>Data security is ensured through controlled access, user authentication, secure storage, and regular backups within the Portfolio of Adaptation measures infrastructure.</p>	<p>Data security is ensured through controlled access, user authentication, secure storage, and regular backups within the DSS infrastructure.</p>	N/A
D.2 Data storage					

<p><i>Is the data stored securely in trusted or certified repositories for long-term retention and curation (internal and/or external)? If applicable, please specify the type of repository used.</i></p>	N/A	Internal repositories: RAF uses LNEC resources for computation and storage; RAT - NCSR D protected by firewall).	The database used is PostgreSQL, a robust relational database system. The platform includes front-end and back-end components.	Data is stored within the DSS infrastructure and associated databases. External datasets remain stored in repositories (like Zenodo) managed by their respective owners.	N/A
E. ETHICAL ISSUES					
E.1 Ethical or legal issues					
<p><i>Are there any ethical or legal issues that may affect data sharing? If relevant, please describe the issues and indicate whether they are addressed through the ethics review process or referenced in the Description of the Action (DoA).</i></p>	N/A	RAF: no ethical or legal issues, sharing is decided by the user; RAT information could be considered as SENSITIVE if the initial input was classified as such)	N/A	N/A	N/A
E.2 Personal data					
<p><i>Does the data include personal data? If yes, is compliance with the GDPR ensured? Is informed consent included for data sharing and long-term retention of personal data?</i></p>	N/A	No	N/A	Task T3.4 processes limited personal data solely for the purpose of user account creation and access management (e.g. name, email address, login credentials). This processing is necessary for the operation of the DSS and is carried out in compliance with	N/A

				the GDPR. No personal data is included in the assessment datasets by default.	
F. OTHER RESEARCH OUTPUTS (software, models, etc)					
F.1 Description of other research outputs					
<i>Does the task generate or reuse other research outputs in addition to research data (e.g. software, algorithmic services, models, protocols, etc)? If yes, please describe the type of output and its role in the task.</i>	N/A	Yes. The apps were built on developments from other projects. The RAF App from RESCCUE and the RAT from EU-Circle. ICARIA RAF App was used in UP2030 project. ICARIA RAF App and RAT tools are software research outputs of ICARIA.	Yes. T3.3 generates/reuses the following other research outputs: - the ICARIA Adaptation Strategies Platform, a web-based software tool; - the platform database and prioritisation interface; - the embedded prioritisation method based on MCDA; - integration links to the future ICARIA DSS and possible cooperation with MAIA AI-supported descriptions.	Task T3.4 produces software outputs, including the DSS platform, impact assessment services, algorithms, and APIs supporting decision-support functionalities.	N/A
F.2 Application of FAIR principles					
<i>Please indicate which of the following apply to the other research outputs:</i> <input type="checkbox"/> The output can be found via a stable reference or landing page <input type="checkbox"/> The output can be	N/A	Regarding the RAF, the RESCCUE output was upgraded to the ICARIA output. It is referenced, but it is no longer available to users per se. RAT output made available from the RAT server. ICARIA RAF App and RAT tools can be found via a	The following apply to the software/platform output: - <input checked="" type="checkbox"/> The output can be found via a stable reference or landing page (ICARIAstrategies.eu) - <input checked="" type="checkbox"/> The output can be	<input checked="" type="checkbox"/> The output can be found via a stable reference or landing page <input checked="" type="checkbox"/> The output can be accessed by others (restricted access via registration) <input checked="" type="checkbox"/> The output uses recognised	N/A

<p><i>accessed by others (open or restricted access)</i></p> <p><input type="checkbox"/> <i>The output uses recognised standards, formats, or interfaces (if applicable)</i></p> <p><input type="checkbox"/> <i>The output can be reused by others (e.g. documentation or licence available)</i></p> <p><i>If none apply, please briefly explain why.</i></p>		<p>stable reference or landing page; can be accessed by others (open or restricted access); uses recognised standards, formats, or interfaces (if applicable); can be reused by others (e.g. documentation or licence available)</p>	<p>accessed by others (public access for browsing measures; restricted access for advanced functions)</p> <p>- <input checked="" type="checkbox"/> <i>The output uses recognised standards, formats, or interfaces (web-based platform, PostgreSQL database, structured classifications, EEA KTM-based categorisation)</i></p>	<p>standards, formats, or interfaces (if applicable)</p> <p><input checked="" type="checkbox"/> <i>The output can be reused by others (documentation available)</i></p>	
F.3 Repository					
<p><i>Where are these outputs made available (if applicable)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i></p>	N/A	<p>RAF is hosted in an internal LNEC repository; RAT is hosted in a server saved by scenario name / user). Both are accessible through a landing page lodged in an internal LNEC repository https://icaria.lnec.pt/</p>	<p>https://www.icaria-project.eu/toolkit/; https://www.icariastrategies.eu/</p>	<p>The DSS software and related documentation are currently maintained in an internal GitLab repository. Selected releases or components may be published on open platforms such as Zenodo, subject to consortium decisions. The DSS itself is available at https://icaria.draxis.gr/</p>	N/A
F.4 Conditions of access and reuse					
<p><i>How are these outputs accessed and reused (e.g. open access, restricted access, internal use only)? If reuse is limited, please provide justification.</i></p>	N/A	<p>Both tools are accessed by users that request it</p>	<p>The software is accessible through the public website. Public browsing of measures is open. Strategy creation and some advanced functionalities require user registration.</p>	<p>Access to the DSS software and related outputs is managed by DRAXIS. Conditions for access and reuse are defined and documented at the point where</p>	N/A

			Administrative functions are restricted. No explicit software reuse licence is provided.	the software or specific components are made available.	
F.5 Long-term preservation					
<i>Is maintenance or long-term availability foreseen after the end of the project? If yes, please describe at a high level.</i>	N/A	The apps and the data created by the users are available in LNEC's or DEMOKRITOS internal systems (respectively, for the RAF and the RAT).	ICARIA's website, which includes the portfolio of adaptation measures, will be maintained for 5 years after the project ends, and Zenodo will be maintained indefinitely.	Long-term availability of the DSS software may be ensured through project or partner-maintained repositories, subject to consortium decisions (exploitacion plan).	N/A
G. OTHER ISSUES					
Other methods of data management					
<i>Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes, please list and briefly describe them.</i>	N/A	N/A	N/A	N/A	N/A

3.2.4 WP4 tasks DMP

Table 5: WP4 Data Management Plan Final

Task	T4.1 - Initial trial design	T4.2.A - Trial implementation and assessment (Trial event part)	T4.2.B - Trial implementation and assessment (Risk assessment part)	T4.3. - Replications and demos	T4.4 - Sustainability and exploitation
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Partner	AIT	AQUA	AQUA	UNINA	DRAXIS
A. DATA SUMMARY					
A1. Purpose of the data					
<i>Describe the purpose of data collection/generation and its relationship to the objectives of ICARIA</i>	D4.1 established the structured framework and parameters required to test and validate ICARIA's solutions. It establishes capability gaps the trials will address, concrete objectives, research questions, and data collection methods. It also suggests how to assess the data gathered during trials and drafts the trial scenarios.	Preparation materials and results of the Trial events organised in the three ICARIA case studies to test the usability and applicability of the DSS tool in each region. Data management not applicable to this task, the materials were created for the purpose of running the trial events. The process involved the CoP participants and other stakeholders.	Hazard, risk, and impact maps of the asset-level models developed for each case study of ICARIA according to their trial activities	Hazard, risk, and impact maps of the asset-level models developed for each case study of ICARIA according to their mini-trial activities. In addition, questionnaires were collected during mini-trials to assess usability, transferability and replicability of the ICARIA framework. These data are used for internal evaluation and are not intended for public dissemination.	Task T4.4 collects and analyses data from partners to develop ICARIA's exploitation and sustainability plan, identifying the Key Exploitable Results (KERS) and their potential impact.
A2. Data types and formats					
<i>Types and formats of generated/re-used data, e.g. measurements, images, surveys, models, code; CSV, XLSX, JSON, TIFF, PDF, etc.</i>	Word, Excel and PDF	Word, Excel and PPT	CVS, SHP and TIFF	CVS, SHP and TIFF; questionnaire responses and evaluation forms stored as Excel or Word	This task generates data in the form of excel, from customised questionnaires that were created and distributed to the partners for their completion.
A3. Reuse of existing data					
<i>Do you re-use any existing data and what do you re-use it for?</i>	TGM handbook was reused to establish the methodological framework for trial planning. Technical	None	Climatic projections of Task 1.2 are used as inputs for the hazard models	Climatic projections of Task 1.2 are used as inputs for the hazard models	No prior data were reused for this task.

	specifications from previous deliverables (D3.2, D3.3, and D3.6) and project-internal excel sheets were used to define the parameters for the solutions being trialled. TGM handbook was developed in DRIVER+ project. Remaining data was generated in ICARIA.				
A4. Origin/Provenance of the data					
<i>What is the origin/provenance of the data, either generated or re-used?</i>	TGM handbook was developed in DRIVER+ project. Remaining data was generated in ICARIA.	Generated in ICARIA	Generated in ICARIA	Generated in ICARIA	Data generated by ICARIA partners as part of Task T4.4 within WP4
A5. Size of the data					
<i>What is the size of the data? (e.g. MB/GB, number of files)</i>	TGM handbook is a PDF approximately 12MB in size, initial trial design ~6MB, other input data is of similar size.	A few word, excels and ppts per CS	Variable, but up to 50 files per case study up to 1GB each	Variable, but up to 50 files per case study up to 1GB each	158 KB
A6. Data utility					
<i>To whom might be useful ('data utility'), outside the project in terms of potential value or relevance of the data.</i>	N/A	Regional administration, planners, risk management institutions and infrastructure operators, though the materials were primarily generated for the purposes of the trials and	Regional administration, planners, risk management institutions and infrastructure operators	Regional administration, planners, risk management institutions and infrastructure operators. Questionnaire results are used internally for evaluation of replicability and usability of the ICARIA	Useful to public authorities, researchers, and other stakeholders interested in the deployment and sustainability of ICARIA results, including the DSS.

		thus it is not foreseen that they are published.		framework and are not intended for public dissemination.	
B.1 FAIR DATA: FINDABLE					
B.1.1 Data identification					
<i>Do you make use of persistent and unique identifiers such as Digital Object Identifiers (DOI)?</i>	N/A	N/A	Yes, via Zenodo	Yes, via Zenodo	N/A
B.1.2 Provision of metadata					
<i>Is metadata provided to allow discovery of the dataset(s)? If yes, list the main metadata elements (e.g. title, creator, date, keywords).</i>	N/A	N/A	Yes	Yes	N/A
B.1.3 Keywords					
<i>Are search keywords provided in the metadata to optimise the possibility for discovery and then potential re-use?</i>	N/A	N/A	Yes	Yes	N/A
B.1.4 Versioning					
<i>Do you document different versions of the datasets to allow traceability. If yes, describe the versioning approach.</i>	N/A	N/A	One single version is provided	One single version is provided	N/A
B.1.5 Harvesting					

<p><i>Is metadata offered in such a way that it can be harvested and indexed (e.g. through repositories, catalogues, or standard protocols)?</i></p>	N/A	N/A	<p>Metadata is easily indexed, filtered and consulted in the ZENODO platform where datasets are accessible</p>	<p>Metadata is easily indexed, filtered and consulted in the ZENODO platform where datasets are accessible</p>	N/A
B.1.6 Standards for metadata creation					
<p><i>What disciplinary or general standards will be followed for the metadata? This refers to metadata standards (e.g. DataCite / Dublin Core) to support discovery and indexing in repositories.</i></p>	N/A	N/A	<p>Following the own details that Zenodo offers for these datasets, Zenodo primarily uses the DataCite Metadata Schema (v4) for describing datasets and research objects, ensuring they are findable and citable. It also supports extended metadata formats including Dublin Core, MARCXML, and JSON-LD (Schema.org).</p>	<p>Following the own details that Zenodo offers for these datasets, Zenodo primarily uses the DataCite Metadata Schema (v4) for describing datasets and research objects, ensuring they are findable and citable. It also supports extended metadata formats including Dublin Core, MARCXML, and JSON-LD (Schema.org).</p>	N/A
B.2 FAIR DATA: ACCESSIBLE					
B.2.1 Data repository					
<p><i>How will the data be accessible (e.g. by depositing it in a repository)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository,</i></p>	N/A	<p>Questionnaires, responses and evaluation materials are stored in the internal project shared space and are not publicly available.</p>	<p>Risk assessment maps from trials are accessible via Zenodo: https://zenodo.org/records/18633204; https://zenodo.org/records/18712826; https://zenodo.org/records/18709629;</p>	<p>Risk assessment maps from mini-trials are accessible via Zenodo: https://zenodo.org/records/19129659; https://zenodo.org/records/1923759 ; https://zenodo.org/records/19237592 questionnaires,</p>	<p>Data are stored internally within DRAXIS systems and shared only with consortium partners.</p>

<p><i>project website, internal system).</i></p>			<p>https://zenodo.org/records/18715683</p>	<p>responses and evaluation materials are stored in the internal project shared space and are not publicly available.</p>	
<p>B.2.2 Open and closed datasets</p>					
<p><i>Will all data under this task be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why. If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.</i></p>	<p>N/A</p>	<p>Questionnaires, responses and internal evaluation materials are restricted to the consortium because they contain internal assessments and stakeholder feedback.</p>	<p>Only the final hazard, impact and risk maps will be made available. Due to data privacy limitations and existing NDAs, the models won't be public.</p>	<p>Only the final hazard, impact and risk maps will be made available. Due to data privacy limitations and existing NDAs, the models won't be public. Questionnaires, responses and internal evaluation materials are restricted to the consortium because they contain internal assessments and stakeholder feedback.</p>	<p>N/A</p>
<p>B.2.3 Conditions of access</p>					
<p><i>Will the data be accessible through a free and standardized access protocol e.g. HTTP, FTP, APIs)? If there are restrictions on use, how will access be provided to</i></p>	<p>N/A</p>	<p>N/A</p>	<p>Yes, via Zenodo</p>	<p>Yes, via Zenodo for the publishable materials</p>	<p>N/A</p>

<i>the data, both during and after the end of the project?</i>					
B.2.4 Identity verification					
<i>How will the identity of the person accessing the data be ascertained? Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?</i>	N/A	N/A	There's no need to identify people accessing the data.	There's no need to identify people accessing the data.	Data access is limited to consortium partners; DRAXIS oversees internal access.
B.2.5 Metadata accessibility					
<i>Is metadata made openly available and licensed under a public domain dedication (CCO)? Does the metadata include information enabling users to understand how access to the data can be requested or obtained?</i>	N/A	N/A	Metadata from Zenodo is openly available, and data offered follows " Creative Commons Attribution 4.0 International " license, being explicitly mentioned in the download, as well as the citing method, if there's a reuse of the data made.	Metadata from Zenodo is openly available, and data offered follows " Creative Commons Attribution 4.0 International " license, being explicitly mentioned in the download, as well as the citing method, if there's a reuse of the data made.	N/A
B.2.6 Duration of accessibility					
<i>For how long will the data remain available and findable? Will metadata remain available even if the data are no longer accessible?</i>	N/A	N/A	Datasets uploaded to Zenodo will remain being available and accessible for an undetermined time after ICARIA's end.	Datasets uploaded to Zenodo will remain being available and accessible for an undetermined time after ICARIA's end.	Accessible to consortium for the duration of the project; no public access planned.

B.2.7 Software required for access					
<i>Is reference to any software required to access or read the data provided?</i>	N/A	N/A	Access to Zenodo requires only a standard web browser.	Access to Zenodo requires only a standard web browser.	N/A
B.3 FAIR DATA: INTEROPERABLE					
B.3.1 Vocabularies and ontologies					
<i>What data and/or metadata vocabularies, standards or methodologies are followed to make data interoperable? This refers to domain-relevant data formats, coordinate systems, controlled vocabularies, etc.</i>	N/A	N/A	Metadata documentation will include all relevant clarifications for data interoperability	Metadata documentation will include all relevant clarifications for data interoperability	N/A
B.3.2 Interoperability of vocabularies and ontologies					
<i>If uncommon or project-specific ontologies or vocabularies are used or generated, are mappings provided to more commonly used standards?</i>	N/A	N/A	Metadata documentation will include all relevant clarifications for data interoperability	Metadata documentation will include all relevant clarifications for data interoperability	N/A
B.3.3 Data linkage					

<i>Does your data include qualified references to other data (e.g. other data from ICARIA, or datasets from previous research)?</i>	N/A	N/A	Inputs, scenarios, and outputs are linked, when needed, to their corresponding identifier, specifically detailed in D4.2	Inputs, scenarios, and outputs are linked, when needed, to their corresponding identifier, specifically detailed in D4.3	N/A
B.4 FAIR DATA: REUSABLE					
B.4.1 Documentation					
<i>Do you provide documentation to ensure that data can be understood and reused by others (e.g. readme files with information on methodology, analyses, definitions, units of measurement, etc.)?</i>	N/A	N/A	Metadata documentation will include all relevant clarifications for data interoperability	Metadata documentation will include all relevant clarifications for data interoperability	N/A
B.4.2 Licensing and usage rights					
<i>Is your data freely available in the public domain (now or in the future) to permit re-use? Provide details on licensing arrangements that support reusability.</i>	N/A	N/A	As mentioned previously, all T4.2 data is freely available now and in the future, uploaded in Zenodo, following the " Creative Commons Attribution 4.0 International " license allowing their reuse with a specific mention of the source of the data.	As mentioned previously, all T4.3 data is freely available now and in the future, uploaded in Zenodo, following the " Creative Commons Attribution 4.0 International " license allowing their reuse with a specific mention of the source of the data.	N/A
B.4.3 Use by third parties					
<i>Is the data produced and/or used in the task</i>	N/A	N/A	Yes, completely available and usable for third parties.	Yes, completely available and usable for third parties.	N/A

<i>usable by third parties, in particular after the end of the project? If limitations apply, please describe them.</i>					
B.4.4 Documentation of provenance					
<i>Is the provenance of the data thoroughly documented and how?</i>	N/A	N/A	Yes, all data, its sources, permissions, quantity and type is completely documented. Information about it is accessible at D4.2 document of ICARIA project, plus in the information attached to the datasets.	Yes, all data, its sources, permissions, quantity and type is completely documented. Information about it is accessible at D4.3 document of ICARIA project, plus in the information attached to the datasets.	N/A
B.4.5 Data quality					
<i>How is the data quality assured and documented? Include information regarding validation processes, quality control steps, or peer review.</i>	N/A	N/A	ICARIA own's review procedures and the project validation by the European Commission validates the data quality	ICARIA own's review procedures and the project validation by the European Commission validates the data quality	Partners completed questionnaires; DRAXIS, as the exploitation manager, conducted bilateral meetings to refine and validate responses
C. ALLOCATION OF RESOURCES					
C.1 Responsibility of data management					
<i>Who is responsible (partner) for data</i>	AIT	Each Case Study Facilitator is responsible	Each Case Study Facilitator is responsible for the data generated in their Case	Each Case Study Facilitator is responsible for the data generated in their Case	DRAXIS is responsible for data management within

<i>management within this task?</i>			Study: AQUATEC for AMB CS, AIT for SLB CS and DEMOKRITOS for SAR CS.	Study: AQUATEC for AMB CS, AIT for SLB CS and DEMOKRITOS for SAR CS.	Task T4.4, in coordination with contributing partners.
C.2 FAIR costs					
<i>What are the costs for making your data FAIR in ICARIA (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.)? How will these be covered? Note that costs related to research data/output management may be eligible as part of the grant.</i>	N/A	N/A	No costs are foreseen for making	No costs are foreseen for making	No costs applicable
C.3 Long term preservation					
<i>How will long term preservation be ensured (if applicable)? What are the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?</i>	N/A	N/A	Long term preservation is guaranteed since data is stored in Zenodo already, with no costs for that and no time limit for its use.	Long term preservation is guaranteed since data is stored in Zenodo already, with no costs for that and no time limit for its use.	N/A
D. DATA SECURITY					
D.1 Data security					

<p><i>What provisions are in place for data security (including data recovery and secure storage and transmission of sensitive data)?</i></p>	N/A	N/A	Data is stored in Zenodo; no security is needed for its access or recovery.	Data is stored in Zenodo; no security is needed for its access or recovery.	Data stored securely on DRAXIS internal systems; shared only with consortium partners; no sensitive personal data included
D.2 Data storage					
<p><i>Is the data stored securely in trusted or certified repositories for long-term retention and curation (internal and/or external)? If applicable, please specify the type of repository used.</i></p>	N/A	N/A	Data is stored in Zenodo repository, a trusted platform for open access and FAIR data sharing within the research community.	Data is stored in Zenodo repository, a trusted platform for open access and FAIR data sharing within the research community.	Internal secure servers at DRAXIS; no external repository
E. ETHICAL ISSUES					
E.1 Ethical or legal issues					
<p><i>Are there any ethical or legal issues that may affect data sharing? If relevant, please describe the issues and indicate whether they are addressed through the ethics review process or referenced in the Description of the Action (DoA).</i></p>	N/A	N/A	N/A	N/A	N/A
E.2 Personal data					
<p><i>Does the data include personal data? If yes, is</i></p>	N/A	Regarding personal data collected for the	N/A	Regarding personal data collected for the	N/A

<p><i>compliance with the GDPR ensured? Is informed consent included for data sharing and long-term retention of personal data?</i></p>		<p>organisation of trial events, compliance with the GDPR is ensured, and informed consent is included.</p>		<p>organisation of mini-trial events, compliance with the GDPR is ensured, and informed consent is included.</p>	
<p>F. OTHER RESEARCH OUTPUTS (software, models, etc)</p>					
<p>F.1 Description of other research outputs</p>					
<p><i>Does the task generate or reuse other research outputs in addition to research data (e.g. software, algorithmic services, models, protocols, etc)? If yes, please describe the type of output and its role in the task.</i></p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>
<p>F.2 Application of FAIR principles</p>					
<p><i>Please indicate which of the following apply to the other research outputs:</i></p> <p><input type="checkbox"/> <i>The output can be found via a stable reference or landing page</i></p> <p><input type="checkbox"/> <i>The output can be accessed by others (open</i></p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>

<p><i>or restricted access)</i></p> <p><input type="checkbox"/> <i>The output uses recognised standards, formats, or interfaces (if applicable)</i></p> <p><input type="checkbox"/> <i>The output can be reused by others (e.g. documentation or licence available)</i></p> <p><i>If none apply, please briefly explain why.</i></p>					
F.3 Repository					
<p><i>Where are these outputs made available (if applicable)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i></p>	N/A	N/A	N/A	N/A	N/A
F.4 Conditions of access and reuse					
<p><i>How are these outputs accessed and reused (e.g. open access, restricted access, internal use only)? If reuse is limited, please provide justification.</i></p>	N/A	N/A	N/A	N/A	N/A
F.5 Long-term preservation					

<i>Is maintenance or long-term availability foreseen after the end of the project? If yes, please describe at a high level.</i>	N/A	N/A	N/A	N/A	N/A
G. OTHER ISSUES					
Other methods of data management					
<i>Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes, please list and briefly describe them.</i>	N/A	N/A	N/A	N/A	N/A

3.2.5 WP5 tasks DMP

Table 6: WP5 Data Management Plan Final

Task	T5.1 - Communication tools and materials	T5.2 - Dissemination plan and activities	T5.3 - Strengthening ICARIA outreach	T5.4 - Stakeholders engagement
<i>Partner</i>	CETAQUA	CETAQUA	AQUA	UNINA
A. DATA SUMMARY				
A1. Purpose of the data				
<i>Describe the purpose of data collection/generation and its relationship to the objectives of ICARIA</i>	Data management not applicable to this task, it simply gathers public information about other WPs. This task produces the project website	Development and publication of scientific papers and abstracts for conferences, and preparation of presentations at events, conferences and workshops. Collection of	This task involved participating in some events and conferences. No data was generated. Just some abstracts available in the project	This task involved participating in local CoPs (Community of Practices) preparation of presentations at events, conferences and

	www.icaria-project.eu and communication materials.	personal information for registration at events.	website and the proceedings of the corresponding conferences.	workshops. Materials were only produced to be used for the purposes of the CoP events, thus no publishing or post-project storing is foreseen. Collection of personal information of participants was needed for registration at events.
A2. Data types and formats				
<i>Types and formats of generated/re-used data, e.g. measurements, images, surveys, models, code; CSV, XLSX, JSON, TIFF, PDF, etc.</i>	N/A	Scientific papers, abstracts, presentations, figures and tables (PDF, DOCX, PPTX, XLSX, image formats). Administrative data related to event registration (text / spreadsheet formats).	Abstracts and short papers (PDF / text formats)	Measurements, images, graphics, Excels
A3. Reuse of existing data				
<i>Do you re-use any existing data and what do you re-use it for?</i>	N/A	Data generated in other WPs are reused for the preparation of scientific publications and dissemination material.	ICARIA results reused for dissemination purposes	Data generated in other WPs is used for the development of scientific papers.
A4. Origin/Provenance of the data				
<i>What is the origin/provenance of the data, either generated or re-used?</i>	N/A	Data originate from ICARIA project results and from dissemination activities carried out within WP5.	Generated in ICARIA	Generated in ICARIA and re-used
A5. Size of the data				

<i>What is the size of the data? (e.g. MB/GB, number of files)</i>	N/A	It varies, small files (typically KB-MB range).	100 to 500 KB	It varies
A6. Data utility				
<i>To whom might be useful ('data utility'), outside the project in terms of potential value or relevance of the data.</i>	N/A	The results are potentially useful to the scientific community, public authorities, infrastructure operators, and practitioners working on climate risk assessment, resilience planning, and adaptation decision-making.	Researchers documenting similar studies as in ICARIA who used them as bibliographic references	The results are potentially useful to the scientific community, public authorities, infrastructure operators, and practitioners working on climate risk assessment, resilience planning, and adaptation decision-making
B.1 FAIR DATA: FINDABLE				
B.1.1 Data identification				
<i>Do you make use of persistent and unique identifiers such as Digital Object Identifiers (DOI)?</i>	N/A	Yes, in the case of papers, and in some abstracts	Yes	N/A
B.1.2 Provision of metadata				
<i>Is metadata provided to allow discovery of the dataset(s)? If yes, list the main metadata elements (e.g. title, creator, date, keywords).</i>	N/A	Yes, handled by publisher or repository	Yes, handled by publisher or repository	N/A
B.1.3 Keywords				
<i>Are search keywords provided in the metadata to optimise the possibility</i>	N/A	Handled by publisher or repository	Handled by publisher or repository	N/A

<i>for discovery and then potential re-use?</i>				
B.1.4 Versioning				
<i>Do you document different versions of the datasets to allow traceability. If yes, describe the versioning approach.</i>	N/A	N/A	N/A	N/A
B.1.5 Harvesting				
<i>Is metadata offered in such a way that it can be harvested and indexed (e.g. through repositories, catalogues, or standard protocols)?</i>	N/A	Handled by publisher or repository	Handled by publisher or repository	N/A
B.1.6 Standards for metadata creation				
<i>What disciplinary or general standards will be followed for the metadata? This refers to metadata standards (e.g. DataCite / Dublin Core) to support discovery and indexing in repositories.</i>	N/A	Handled by publisher or repository	Handled by publisher or repository	N/A
B.2 FAIR DATA: ACCESSIBLE				
B.2.1 Data repository				
<i>How will the data be accessible (e.g. by depositing it in a</i>	N/A	The papers are available on ICARIA's website, which will be available for 5 years after the project ends.	Conference proceedings, conference websites and the ICARIA project website.	N/A

<p><i>repository)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i></p>		<p>Conference papers and abstracts may also be available in conference proceedings.</p>		
B.2.2 Open and closed datasets				
<p><i>Will all data under this task be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why. If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.</i></p>	<p>N/A</p>	<p>All outputs under this task are openly available</p>	<p>All outputs under this task are openly available</p>	<p>N/A</p>
B.2.3 Conditions of access				
<p><i>Will the data be accessible through a free and standardized access protocol e.g. HTTP, FTP, APIs)? If there are</i></p>	<p>N/A</p>	<p>Open access via publisher websites, and the project website</p>	<p>Access through conference websites or proceedings</p>	<p>N/A</p>

<i>restrictions on use, how will access be provided to the data, both during and after the end of the project?</i>				
B.2.4 Identity verification				
<i>How will the identity of the person accessing the data be ascertained? Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?</i>	N/A	There is no need to identify people accessing the data	There is no need to identify people accessing the data	N/A
B.2.5 Metadata accessibility				
<i>Is metadata made openly available and licensed under a public domain dedication (CC0)? Does the metadata include information enabling users to understand how access to the data can be requested or obtained?</i>	N/A	Defined by publisher or repository	Provided by publisher/proceedings	N/A
B.2.6 Duration of accessibility				
<i>For how long will the data remain available and findable? Will metadata remain available even if</i>	N/A	Papers uploaded to ICARIA's website will be maintained for 5 years after the project ends and indefinitely via publisher websites	Indefinite	N/A

<i>the data are no longer accessible?</i>				
B.2.7 Software required for access				
<i>Is reference to any software required to access or read the data provided?</i>	N/A	N/A	N/A	N/A
B.3 FAIR DATA: INTEROPERABLE				
B.3.1 Vocabularies and ontologies				
<i>What data and/or metadata vocabularies, standards or methodologies are followed to make data interoperable? This refers to domain-relevant data formats, coordinate systems, controlled vocabularies, etc.</i>	N/A	Standard document formats	Standard document formats	N/A
B.3.2 Interoperability of vocabularies and ontologies				
<i>If uncommon or project-specific ontologies or vocabularies are used or generated, are mappings provided to more commonly used standards?</i>	N/A	N/A	N/A	N/A

B.3.3 Data linkage				
<i>Does your data include qualified references to other data (e.g. other data from ICARIA, or datasets from previous research)?</i>	N/A	References to ICARIA results	References to ICARIA results	N/A
B.4 FAIR DATA: REUSABLE				
B.4.1 Documentation				
<i>Do you provide documentation to ensure that data can be understood and reused by others (e.g. readme files with information on methodology, analyses, definitions, units of measurement, etc.)?</i>	N/A	Provided in publications	Provided in abstracts / proceedings	N/A
B.4.2 Licensing and usage rights				
<i>Is your data freely available in the public domain (now or in the future) to permit re-use? Provide details on licensing arrangements that support reusability.</i>	N/A	Yes	Yes	N/A
B.4.3 Use by third parties				
<i>Is the data produced and/or used in the task usable by third parties, in particular after the end of</i>	N/A	Yes	Yes	N/A

<i>the project? If limitations apply, please describe them.</i>				
B.4.4 Documentation of provenance				
<i>Is the provenance of the data thoroughly documented and how?</i>	N/A	Described in publications	Described in abstracts / proceedings	N/A
B.4.5 Data quality				
<i>How is the data quality assured and documented? Include information regarding validation processes, quality control steps, or peer review.</i>	N/A	Peer review / conference review	Peer reviewed in conference process	N/A
C. ALLOCATION OF RESOURCES				
C.1 Responsibility of data management				
<i>Who is responsible (partner) for data management within this task?</i>	CETAQUA	CETAQUA / corresponding authors	Corresponding authors	UNINA
C.2 FAIR costs				
<i>What are the costs for making your data FAIR in ICARIA (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.)? How will these be</i>	Covered by the project budget	Covered by project budget	None	N/A

<p><i>covered? Note that costs related to research data/output management may be eligible as part of the grant.</i></p>				
<p>C.3 Long term preservation</p>				
<p><i>How will long term preservation be ensured (if applicable)? What are the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?</i></p>	N/A	<p>Publisher repositories and website (5 years)</p>	<p>Conference proceedings and conference websites</p>	N/A
<p>D. DATA SECURITY</p>				
<p>D.1 Data security</p>				
<p><i>What provisions are in place for data security (including data recovery and secure storage and transmission of sensitive data)?</i></p>	N/A	<p>No sensitive data. Publications and dissemination material stored in partner systems and publisher platforms.</p>	<p>No sensitive data. Dissemination material stored in partner systems, conference platforms and the project website.</p>	N/A
<p>D.2 Data storage</p>				
<p><i>Is the data stored securely in trusted or certified repositories for long-term retention and curation (internal and/or external)? If applicable, please</i></p>	N/A	<p>Stored in publisher repositories and the ICARIA website. Internal administrative data stored in partner systems.</p>	<p>Stored in conference proceedings, publisher platforms, project website and, where applicable, Zenodo.</p>	N/A

<i>specify the type of repository used.</i>				
E. ETHICAL ISSUES				
E.1 Ethical or legal issues				
<i>Are there any ethical or legal issues that may affect data sharing? If relevant, please describe the issues and indicate whether they are addressed through the ethics review process or referenced in the Description of the Action (DoA).</i>	N/A	N/A	N/A	N/A
E.2 Personal data				
<i>Does the data include personal data? If yes, is compliance with the GDPR ensured? Is informed consent included for data sharing and long-term retention of personal data?</i>	N/A	Regarding personal data collected for the organisation of events, compliance with the GDPR is ensured, and informed consent is included.	N/A	Regarding personal data collected for the organisation of events, compliance with the GDPR is ensured, and informed consent is included.
F. OTHER RESEARCH OUTPUTS (software, models, etc)				
F.1 Description of other research outputs				

<p><i>Does the task generate or reuse other research outputs in addition to research data (e.g. software, algorithmic services, models, protocols, etc)? If yes, please describe the type of output and its role in the task.</i></p>	<p>Communication outputs including the ICARIA project website at https://www.icaria-project.eu/, graphic materials, videos and other dissemination content therein used to present project results.</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>
<p>F.2 Application of FAIR principles</p>				
<p><i>Please indicate which of the following apply to the other research outputs:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>The output can be found via a stable reference or landing page</i> <input type="checkbox"/> <i>The output can be accessed by others (open or restricted access)</i> <input type="checkbox"/> <i>The output uses recognised standards, formats, or interfaces (if applicable)</i> <input type="checkbox"/> <i>The output can be reused by others (e.g. documentation or licence available)</i> 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> The output can be found via a stable reference or landing page <input checked="" type="checkbox"/> The output can be accessed by others <input checked="" type="checkbox"/> The output can be reused by others 	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>

<i>If none apply, please briefly explain why.</i>				
F.3 Repository				
<i>Where are these outputs made available (if applicable)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i>	ICARIA project website https://www.icaria-project.eu/	N/A	N/A	N/A
F.4 Conditions of access and reuse				
<i>How are these outputs accessed and reused (e.g. open access, restricted access, internal use only)? If reuse is limited, please provide justification.</i>	Publicly accessible communication material. No sensitive data included.	Data on papers is open access, whereas personal data for event management is for internal use only.	Open access	N/A
F.5 Long-term preservation				
<i>Is maintenance or long-term availability foreseen after the end of the project? If yes, please describe at a high level.</i>	The ICARIA project website will remain available for at least five years after the end of the project.	ICARIA's website, which includes papers, will be maintained for 5 years after the project ends, and on publisher websites	Conferences' website and conference proceedings document	N/A
G. OTHER ISSUES				
Other methods of data management				

<p><i>Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes please list and briefly describe them.</i></p>	N/A	N/A	N/A	N/A
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4 FAIR Data Management

This chapter summarises how the data management policy defined in D6.8 has been applied in practice, based on the information collected from partners and presented in Chapter 3. The initial DMP established the commitment to Open Science, the use of Zenodo and other open repositories for publicly shared outputs, partner responsibility for data management, and controlled handling of sensitive information. The final reporting confirms that these principles have been followed, while reflecting the different types of outputs produced in the project.

4.1 Findable

Findability is ensured mainly through the publication of datasets and other outputs in trusted repositories, in particular the ICARIA Zenodo community. The records listed in Chapter 3 confirm that several datasets and figures have been deposited with DOIs, metadata and licence information.

For outputs that are not published as standalone datasets, their description is provided in the DMP collection template and in the deliverable-level Data Management Statements, which record the origin, format and ownership of the data used or generated in each task.

For outputs generated within project tools and platforms, such as the resilience tools, the adaptation portfolio and the DSS, findability is implemented through internal identifiers, database structures and searchable fields within the corresponding systems.

4.2 Accessible

Accessibility follows the approach defined in D6.8, combining open access for publicly shared results with controlled access where required.

Datasets intended for dissemination are made available through Zenodo, public deliverables and scientific publications (addressed in WP5). The Zenodo records listed in Chapter 3 confirm that part of the project results are openly accessible under standard licences.

Other outputs are accessible only within the corresponding tools or partner environments. This applies in particular to outputs generated within modelling workflows, case studies, resilience tools, the adaptation platform and the DSS, where access may depend on user permissions, partner agreements or ownership of the input data.

This approach is consistent with the policy defined in the initial DMP, according to which sensitive or restricted data remain under the control of the data owner.

4.3 Interoperable

Interoperability is supported through the use of widely adopted formats and standard practices for tabular and geospatial data. The reporting in Chapter 3 shows that most tasks use formats such as CSV, XLSX, JSON, NetCDF, SHP, GeoTIFF, PDF, and common image and multimedia formats, which can be processed by widely available software tools.

Geospatial data use standard coordinate systems and common formats such as SHP and GeoTIFF. The Decision Support System (DSS) can import heterogeneous geospatial and tabular inputs and allows the export of results in widely used formats (e.g. SHP, PDF, PNG, MP4), so that the outputs can be reused outside the platform and after the end of the project. Publicly shared datasets deposited in Zenodo include standard metadata, supporting indexing, citation and reuse.

This is consistent with the policy defined in D6.8, which foresees the use of open or widely used formats whenever possible.

4.4 Reusable

Reusability in ICARIA depends on clear documentation, ownership and access conditions, as defined in the data management policy of D6.8. The reporting collected in Chapter 3 distinguishes between reused data, data generated by the project, and outputs produced dynamically within tools and platforms. This distinction clarifies which results belong to the consortium, which remain under partner or third-party control, and which are generated on demand within project systems.

Publicly shared datasets deposited in Zenodo represent the clearest case of reuse by third parties. These records include metadata, citation information and licences, typically under Creative Commons terms, allowing reuse with attribution.

For other outputs, reuse depends on the type of result and on the rights attached to the input data. In several tasks, external datasets, partner-owned information or user-provided data are used, and their reuse is therefore subject to the corresponding agreements. Outputs generated within tools and platforms may be reusable through export functions or through the use of standard formats, but access to the underlying data may remain restricted.

Documentation provided in deliverables, DMS annexes and repository records ensures that the provenance, format and purpose of the data can be understood, even when the outputs are not fully open.

This approach is consistent with the policy defined in D6.8, which states that data should be made openly available whenever possible, while respecting ownership, confidentiality and legal constraints.

5 Storage, backup and preservation

This chapter summarises how ICARIA data and outputs are stored during the project and how their preservation is approached at project completion. In D6.8, storage and preservation were described mainly as intended arrangements, with emphasis on partner responsibility, use of shared project spaces during implementation, and future deposition in Zenodo or other suitable repositories where appropriate. In this final version, publicly shared datasets are already preserved through repository deposition, while platform-based and task-specific outputs are mainly retained within the infrastructures of the partners responsible for the relevant tools and services.

5.1 Storage and organisation during the project

ICARIA follows the distributed approach defined in the initial DMP. Publicly shared datasets are stored in external repositories, in particular Zenodo, which provides persistent identifiers and long-term hosting. The Zenodo records listed in Chapter 3 confirm that this repository has been used for datasets and figures intended for dissemination.

Operational and platform-based outputs are stored within the infrastructures of the partners responsible for the corresponding tools or services. This includes the resilience tools, the Portfolio of Adaptation Solutions and the DSS, which maintain their own databases and internal storage environments.

Project documentation and working files have been shared through consortium spaces during the project, while sensitive data remain under the responsibility of the partner who owns or provides them.

5.2 Backup and recovery

Backup and recovery arrangements in ICARIA are implemented primarily at partner and system level. This is consistent with the project's distributed architecture and with the fact that several of the main outputs are maintained within partner-operated tools and environments.

Backup and recovery are handled at partner or system level. Platform-based environments and internal servers use their own backup procedures, while publicly shared outputs deposited in Zenodo rely on the repository infrastructure for preservation. This approach is consistent with the initial DMP, which assigns responsibility for data storage and security to the partner managing the data.

5.3 Preservation and post-project availability

Datasets deposited in Zenodo are expected to remain available after the end of the project through the repository infrastructure and the use of persistent identifiers.

The project website and the material published therein will remain available for at least five years after the end of the project, in line with the arrangements defined in the dissemination and communication activities.

Other outputs, in particular those linked to tools, case studies or partner-managed systems, remain under the responsibility of the partner who owns or operates the corresponding service. As stated in D6.8, partners are responsible for maintaining their data and tools, and a minimum preservation period of five years after project end is foreseen where applicable.

For platform-based tools and services, including the DSS and other project applications, long-term availability may also depend on the exploitation and sustainability strategy defined for the project results. In these cases, preservation and continued access are linked to the plans of the partner responsible for the corresponding tool or service.

5.4 Responsibilities for long-term stewardship

Responsibility for long-term stewardship follows the allocation defined in the initial DMP. Each partner remains responsible for the data and tools under its control, while publicly deposited datasets remain available through the repository where they were published. The data manager and the coordinator oversee the overall data management approach at project level.

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6 Security and access control

Data security and access control in ICARIA follow the principles defined in D6.8. The project involves the analysis of climate risks at asset level, including in some cases assets that may be considered Critical Infrastructures according to EU Directive 2008/114/EC (European Union, 2022). For this reason, specific precautions have been applied when handling sensitive information.

As established in D6.8, prior to using data related to critical assets, the partner responsible for the task must reach an agreement with the data owner regarding its use, storage and dissemination. Where required, non-disclosure agreements may be established. Sensitive information is not stored in public shared spaces and is not included in public deliverables. Each partner remains responsible for the correct use of the data under its control, in accordance with the agreements defined with the data provider.

Publicly shared datasets are deposited in Zenodo or included in public deliverables and are accessible without authentication. Other outputs, in particular those generated within modelling environments, case studies, tools and platforms such as the DSS, may require user permissions or specific agreements with the data provider. Internal servers, databases and project tools use controlled access and regular backup procedures, while publicly shared datasets are stored in trusted repositories.

Personal data are limited to project coordination, stakeholder interaction, user registration in project tools, and trial or survey activities. These data are handled in accordance with GDPR and under the supervision of WP7, which is responsible for monitoring ethical compliance in the project. Where questionnaires, interviews or participatory activities are carried out, participants are informed about the use of the data, and the information is anonymised before publication of the results.

No additional security issues beyond those identified in D6.8 have been reported during the project.

7 Legal and ethical aspects

Legal and ethical aspects in ICARIA have been handled in accordance with the approach defined in D6.8 and under the supervision of WP7, which is responsible for monitoring ethical aspects throughout the project.

The initial DMP identified several categories of data that could require special attention, including professional contact data of project participants, financial reporting data, information related to Communities of Practice, data concerning critical assets, and data collected during trials, surveys or interviews. These categories have been managed according to the procedures defined in D6.8.

Professional contact data have been used only for project communication and coordination. Financial reporting information has been accessible only to the project coordination team and the responsible partner institutions. Data related to stakeholders, case studies and Communities of Practice have been shared according to the agreements defined with the participants. Where questionnaires, interviews or trial assessments were carried out, the information was anonymised before publication, and the original data were stored securely for the period required for project evaluation.

Some tasks involved the use of external or partner-owned data, including information related to assets that may be considered critical infrastructures. In these cases, data have been used according to agreements with the data owner, and sensitive information has not been included in public deliverables.

The main datasets produced in the project relate to climate projections, modelling results and risk assessments, and do not contain personal data. Limited personal data used for coordination, stakeholder interaction or user access to project tools have been handled in accordance with GDPR and the provisions of the Grant Agreement.

No additional ethical or legal issues beyond those identified in the initial DMP have been reported during the project.

References

European Commission. (2024). *Framework for defining climate mitigation pathways based on understanding and integrated assessment of climate impacts, adaptation strategies and societal transformation* (KNOWING, GA 101056841). European Commission.

European Commission. (2021). *Horizon Europe Data Management Plan Template*. OpenAire. https://www.openaire.eu/images/Guides/HORIZON_EUROPE_Data-Management-Plan-Template.pdf

European Union. (2022). *Directive (EU) 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114/EC*. Official Journal of the European Union.

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Annex I: Template for the Data Management Plan

Table 7: Data Management Plan Template

A. DATA SUMMARY
A1. Purpose of the data
<i>Describe the purpose of data collection/generation and its relationship to the objectives of ICARIA</i>
A2. Data types and formats
<i>Types and formats of generated/re-used data, e.g. measurements, images, surveys, models, code; CSV, XLSX, JSON, TIFF, PDF, etc.</i>
A3. Reuse of existing data
<i>Do you re-use any existing data and what do you re-use it for?</i>
A4. Origin/Provenance of the data
<i>What is the origin/provenance of the data, either generated or re-used?</i>
A5. Size of the data
<i>What is the size of the data? (e.g. MB/GB, number of files)</i>
A6. Data utility
<i>To whom might be useful ('data utility'), outside the project in terms of potential value or relevance of the data.</i>
B.1 FAIR DATA: FINDABLE
B.1.1 Data identification
<i>Do you make use of persistent and unique identifiers such as Digital Object Identifiers (DOI)?</i>
B.1.2 Provision of metadata
<i>Is metadata provided to allow discovery of the dataset(s)? If yes, list the main metadata elements (e.g. title, creator, date, keywords).</i>
B.1.3 Keywords
<i>Are search keywords provided in the metadata to optimise the possibility for discovery and then potential re-use?</i>
B.1.4 Versioning
<i>Do you document different versions of the datasets to allow traceability. If yes, describe the versioning approach.</i>
B.1.5 Harvesting
<i>Is metadata offered in such a way that it can be harvested and indexed (e.g. through repositories, catalogues, or standard protocols)?</i>
B.1.6 Standards for metadata creation
<i>What disciplinary or general standards will be followed for the metadata? This refers to metadata standards (e.g. DataCite / Dublin Core) to support discovery and indexing in repositories.</i>
B.2 FAIR DATA: ACCESSIBLE
B.2.1 Data repository
<i>How will the data be accessible (e.g. by depositing it in a repository)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).</i>
B.2.2 Open and closed datasets
<i>Will all data under this task be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why. If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.</i>
B.2.3 Conditions of access

Will the data be accessible through a free and standardized access protocol e.g. HTTP, FTP, APIs)? If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?

B.2.4 Identity verification

How will the identity of the person accessing the data be ascertained? Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?

B.2.5 Metadata accessibility

Is metadata made openly available and licensed under a public domain dedication (CC0)? Does the metadata include information enabling users to understand how access to the data can be requested or obtained?

B.2.6 Duration of accessibility

For how long will the data remain available and findable? Will metadata remain available even if the data are no longer accessible?

B.2.7 Software required for access

Is reference to any software required to access or read the data provided?

B.3 FAIR DATA: INTEROPERABLE

B.3.1 Vocabularies and ontologies

What data and/or metadata vocabularies, standards or methodologies are followed to make data interoperable? This refers to domain-relevant data formats, coordinate systems, controlled vocabularies, etc.

B.3.2 Interoperability of vocabularies and ontologies

If uncommon or project-specific ontologies or vocabularies are used or generated, are mappings provided to more commonly used standards?

B.3.3 Data linkage

Does your data include qualified references to other data (e.g. other data from ICARIA, or datasets from previous research)?

B.4 FAIR DATA: REUSABLE

B.4.1 Documentation

Do you provide documentation to ensure that data can be understood and reused by others (e.g. readme files with information on methodology, analyses, definitions, units of measurement, etc.)?

B.4.2 Licensing and usage rights

Is your data freely available in the public domain (now or in the future) to permit re-use? Provide details on licensing arrangements that support reusability.

B.4.3 Use by third parties

Is the data produced and/or used in the task usable by third parties, in particular after the end of the project? If limitations apply, please describe them.

B.4.4 Documentation of provenance

Is the provenance of the data thoroughly documented and how?

B.4.5 Data quality

How is the data quality assured and documented? Include information regarding validation processes, quality control steps, or peer review.

C. ALLOCATION OF RESOURCES

C.1 Responsibility of data management

Who is responsible (partner) for data management within this task?

C.2 FAIR costs

What are the costs for making your data FAIR in ICARIA (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.)? How will these be covered? Note that costs related to research data/output management may be eligible as part of the grant.

C.3 Long term preservation

How will long term preservation be ensured (if applicable)? What are the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?

D. DATA SECURITY

D.1 Data security

What provisions are in place for data security (including data recovery and secure storage and transmission of sensitive data)?

D.2 Data storage

Is the data stored securely in trusted or certified repositories for long-term retention and curation (internal and/or external)? If applicable, please specify the type of repository used.

E. ETHICAL ISSUES

E.1 Ethical or legal issues

Are there any ethical or legal issues that may affect data sharing? If relevant, please describe the issues and indicate whether they are addressed through the ethics review process or referenced in the Description of the Action (DoA).

E.2 Personal data

Does the data include personal data? If yes, is compliance with the GDPR ensured? Is informed consent included for data sharing and long-term retention of personal data?

F. OTHER RESEARCH OUTPUTS (software, models, etc)

F.1 Description of other research outputs

Does the task generate or reuse other research outputs in addition to research data (e.g. software, algorithmic services, models, protocols, etc)? If yes, please describe the type of output and its role in the task.

F.2 Application of FAIR principles

Please indicate which of the following apply to the other research outputs:

- The output can be found via a stable reference or landing page*
- The output can be accessed by others (open or restricted access)*
- The output uses recognised standards, formats, or interfaces (if applicable)*
- The output can be reused by others (e.g. documentation or licence available)*

If none apply, please briefly explain why.

F.3 Repository

Where are these outputs made available (if applicable)? Please provide links or references (e.g. Zenodo, GitHub/GitLab, institutional repository, project website, internal system).

F.4 Conditions of access and reuse

How are these outputs accessed and reused (e.g. open access, restricted access, internal use only)? If reuse is limited, please provide justification.

F.5 Long-term preservation

Is maintenance or long-term availability foreseen after the end of the project? If yes, please describe at a high level.

G. OTHER ISSUES

Other methods of data management

Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes please list and briefly describe them.

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Annex II: Horizon Europe DMP template questions

1. Data Summary

- Will you re-use any existing data and what will you re-use it for? State the reasons if re-use of any existing data has been considered but discarded.
- What types and formats of data will the project generate or re-use?
- What is the purpose of the data generation or re-use and its relation to the objectives of the project?
- What is the expected size of the data that you intend to generate or re-use?
- What is the origin/provenance of the data, either generated or re-used?
- To whom might your data be useful ('data utility'), outside your project?

2. FAIR data

2.1. Making data findable, including provisions for metadata

- Will data be identified by a persistent identifier?
- Will rich metadata be provided to allow discovery? What metadata will be created? What disciplinary or general standards will be followed? In case metadata standards do not exist in your discipline, please outline what type of metadata will be created and how.
- Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?
- Will metadata be offered in such a way that it can be harvested and indexed?

2.2. Making data accessible

Repository:

- Will the data be deposited in a trusted repository?
- Have you explored appropriate arrangements with the identified repository where your data will be deposited?
- Does the repository ensure that the data is assigned an identifier? Will the repository resolve the identifier to a digital object?

Data:

- Will all data be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why, clearly separating legal and contractual reasons from intentional restrictions. Note that in multi-beneficiary projects it is also possible for specific beneficiaries to keep their data closed if opening their data goes against their legitimate interests or other constraints as per the Grant Agreement.
- If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.
- Will the data be accessible through a free and standardized access protocol?
- If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?
- How will the identity of the person accessing the data be ascertained?

- Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?

Metadata:

- Will metadata be made openly available and licenced under a public domain dedication CCO, as per the Grant Agreement? If not, please clarify why. Will metadata contain information to enable the user to access the data?
- How long will the data remain available and findable? Will metadata be guaranteed to remain available after data is no longer available?
- Will documentation or reference about any software needed to access or read the data be included? Will it be possible to include the relevant software (e.g. in open source code)?

2.3. Making data interoperable

- What data and metadata vocabularies, standards, formats or methodologies will you follow to make your data interoperable to allow data exchange and re-use within and across disciplines? Will you follow community-endorsed interoperability best practices? Which ones?
- In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies, will you provide mappings to more commonly used ontologies? Will you openly publish the generated ontologies or vocabularies to allow reusing, refining or extending them?
- Will your data include qualified references^[1] to other data (e.g. other data from your project, or datasets from previous research)?

2.4. Increase data re-use

- How will you provide documentation needed to validate data analysis and facilitate data re-use (e.g. readme files with information on methodology, codebooks, data cleaning, analyses, variable definitions, units of measurement, etc.)?
- Will your data be made freely available in the public domain to permit the widest re-use possible? - Will your data be licensed using standard reuse licenses, in line with the obligations set out in the Grant Agreement?
- Will the data produced in the project be useable by third parties, in particular after the end of the project?
- Will the provenance of the data be thoroughly documented using the appropriate standards?
- Describe all relevant data quality assurance processes.

3. Other research outputs

- In addition to the management of data, beneficiaries should also consider and plan for the management of other research outputs that may be generated or re-used throughout their projects. Such outputs can be either digital (e.g. software, workflows, protocols, models, etc.) or physical (e.g. new materials, antibodies, reagents, samples, etc.).
- Beneficiaries should consider which of the questions pertaining to FAIR data above, can apply to the management of other research outputs, and should strive to provide sufficient detail on how their research outputs will be managed and shared, or made available for re-use, in line with the FAIR principles.

4. Allocation of resources

- What will the costs be for making data or other research outputs FAIR in your project (e.g. direct and

indirect costs related to storage, archiving, re-use, security, etc.) ?

- How will these be covered? Note that costs related to research data/output management are eligible as part of the Horizon Europe grant (if compliant with the Grant Agreement conditions)
- Who will be responsible for data management in your project?
- How will long term preservation be ensured? Discuss the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept and for how long)?

5. Data security

- What provisions are or will be in place for data security (including data recovery as well as secure storage/archiving and transfer of sensitive data)?
- Will the data be safely stored in trusted repositories for long term preservation and curation?

6. Ethics

- Are there, or could there be, any ethics or legal issues that can have an impact on data sharing? These can also be discussed in the context of the ethics review. If relevant, include references to ethics deliverables and ethics chapter in the Description of the Action (DoA).
- Will informed consent for data sharing and long term preservation be included in questionnaires dealing with personal data?

7. Other issues

- Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes, which ones (please list and briefly describe them)?

Annex III: Table templates for the “Data Management Statement” Annexes

Table 8: Data used in preparation of ICARIA Deliverable #.#

Dataset name	Format	Size	Owner and re-use conditions	Potential Utility within and outside ICARIA	Unique ID

Table 9: Data produced in preparation of ICARIA Deliverable #.#

Dataset name	Format	Size	Owner and re-use conditions	Potential Utility within and outside ICARIA	Unique ID

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